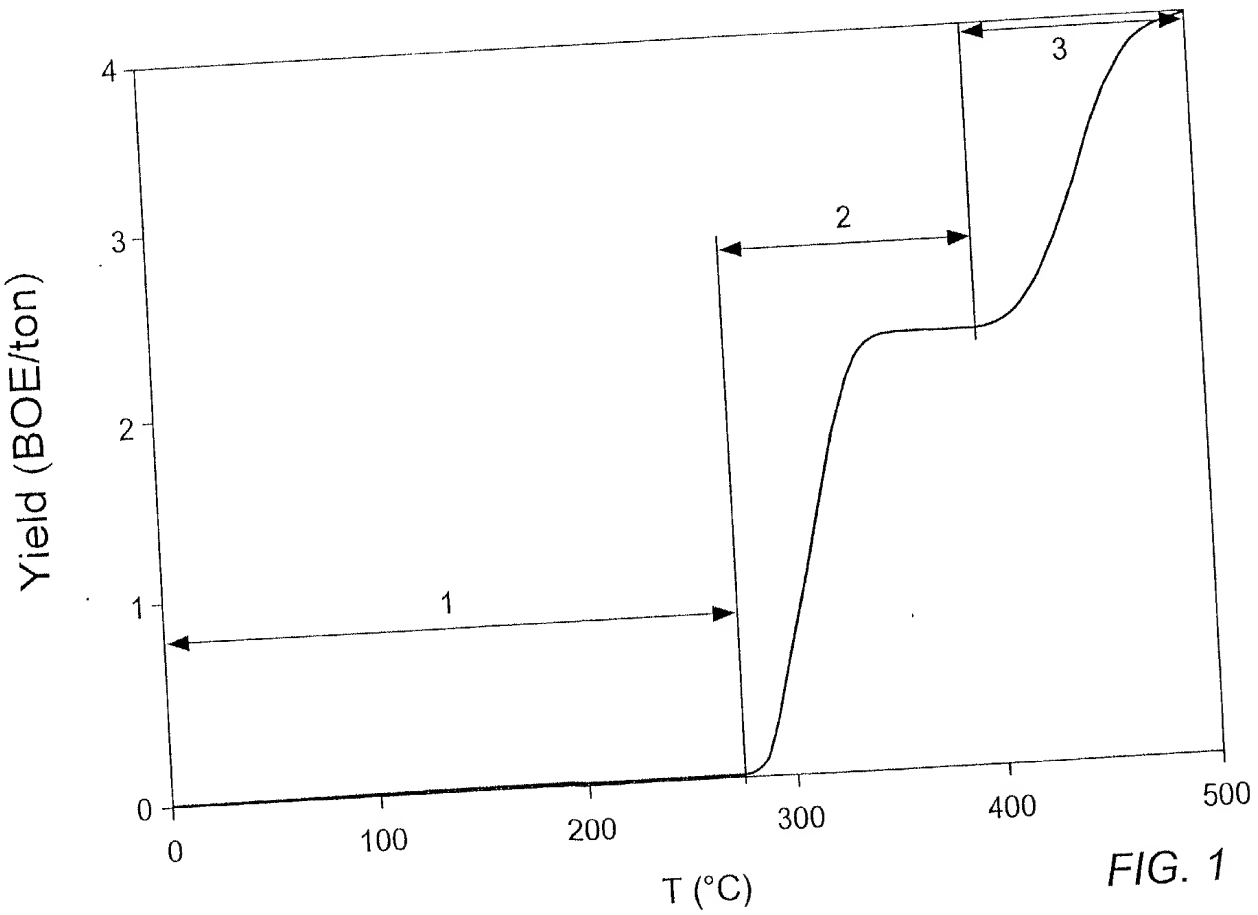
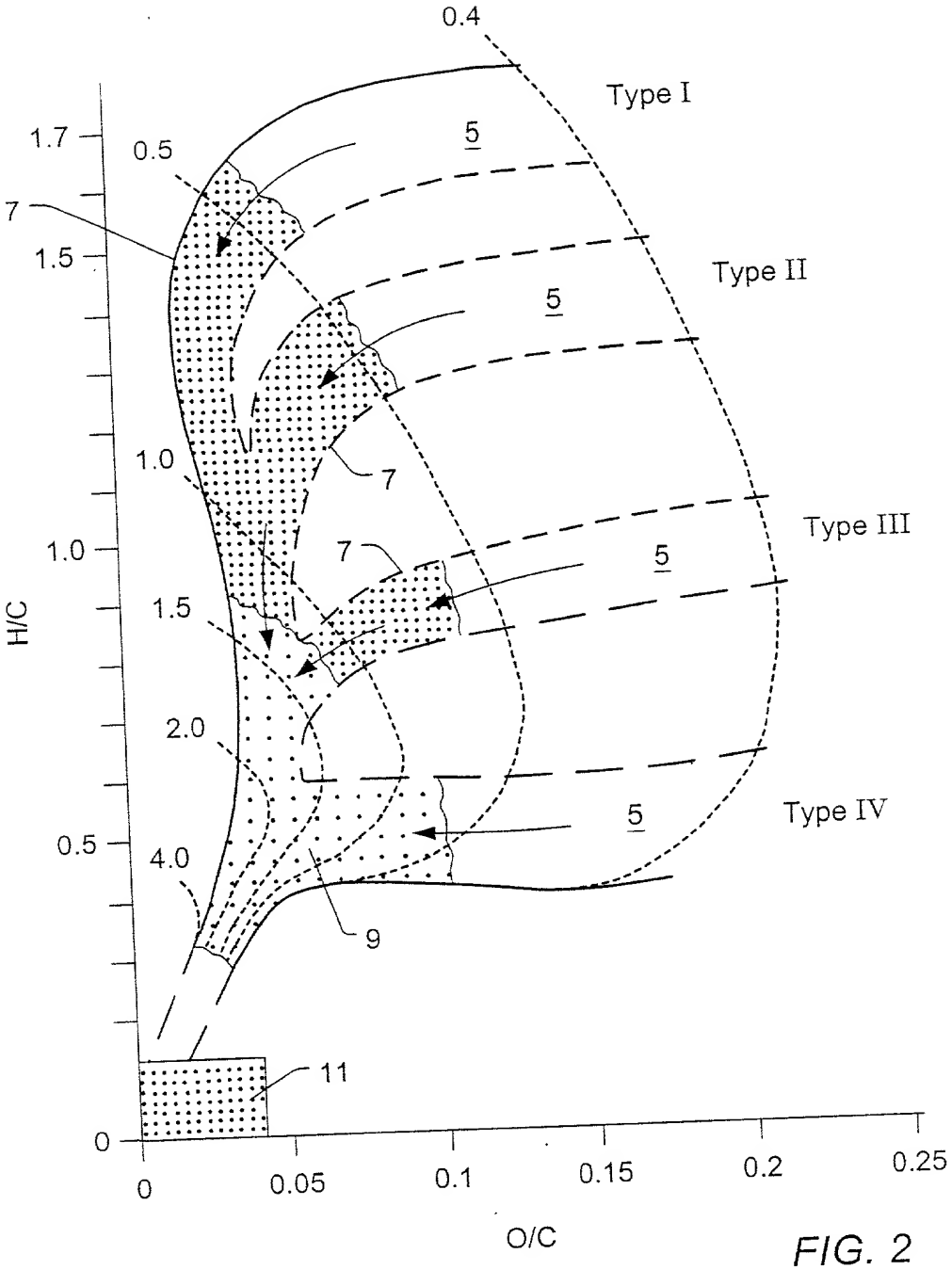


FIG. 1


0.4
Type I
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0.5
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1.5
Type II
5
1.0
7
Type III
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7
5
1.5
2.0
5
Type IV
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0.1
0.15
0.2
0.25
H/C
O/C

FIG. 2

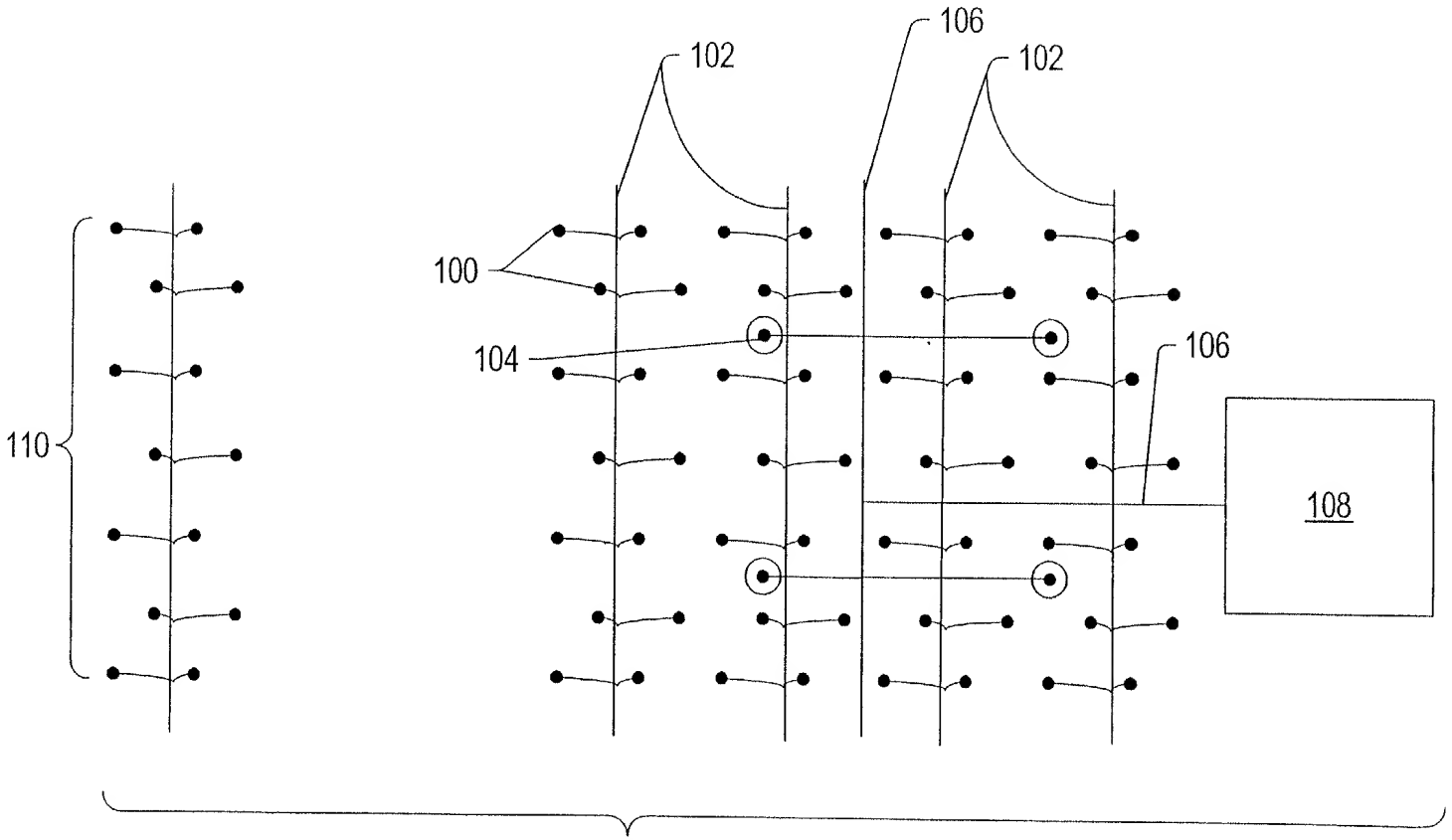

FIG. 3

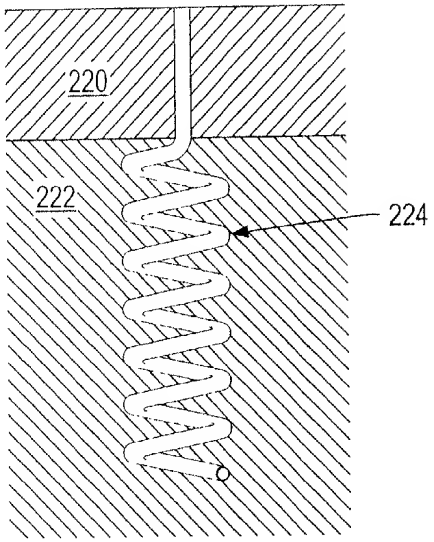

FIG. 3a

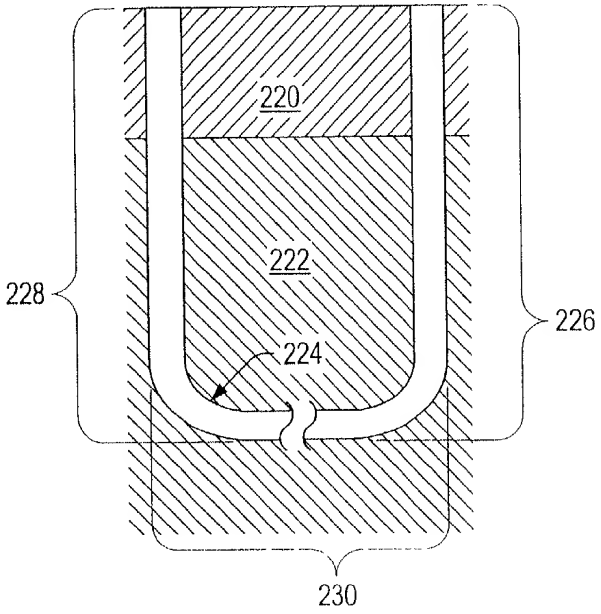

FIG. 3b

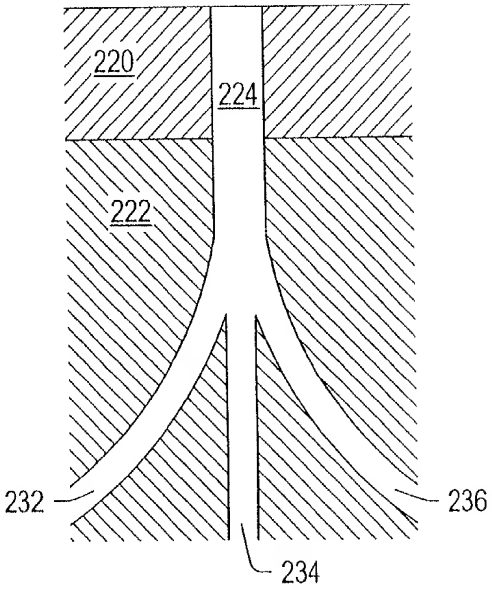

FIG. 3c

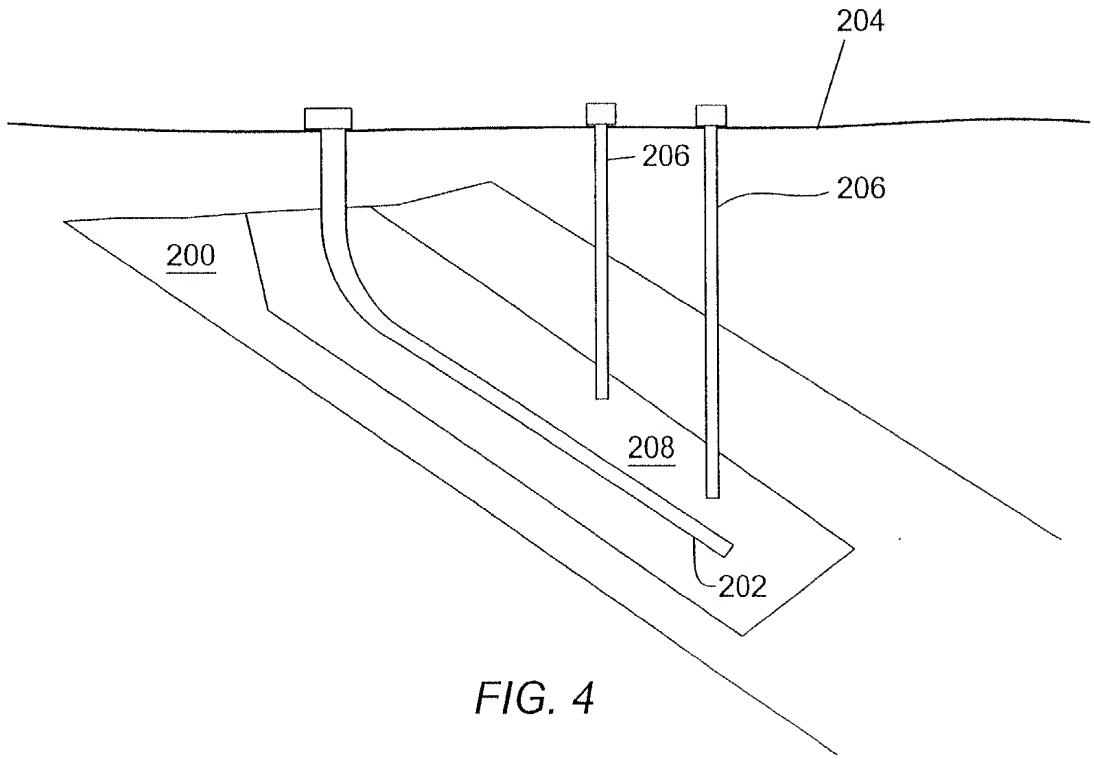

FIG. 4

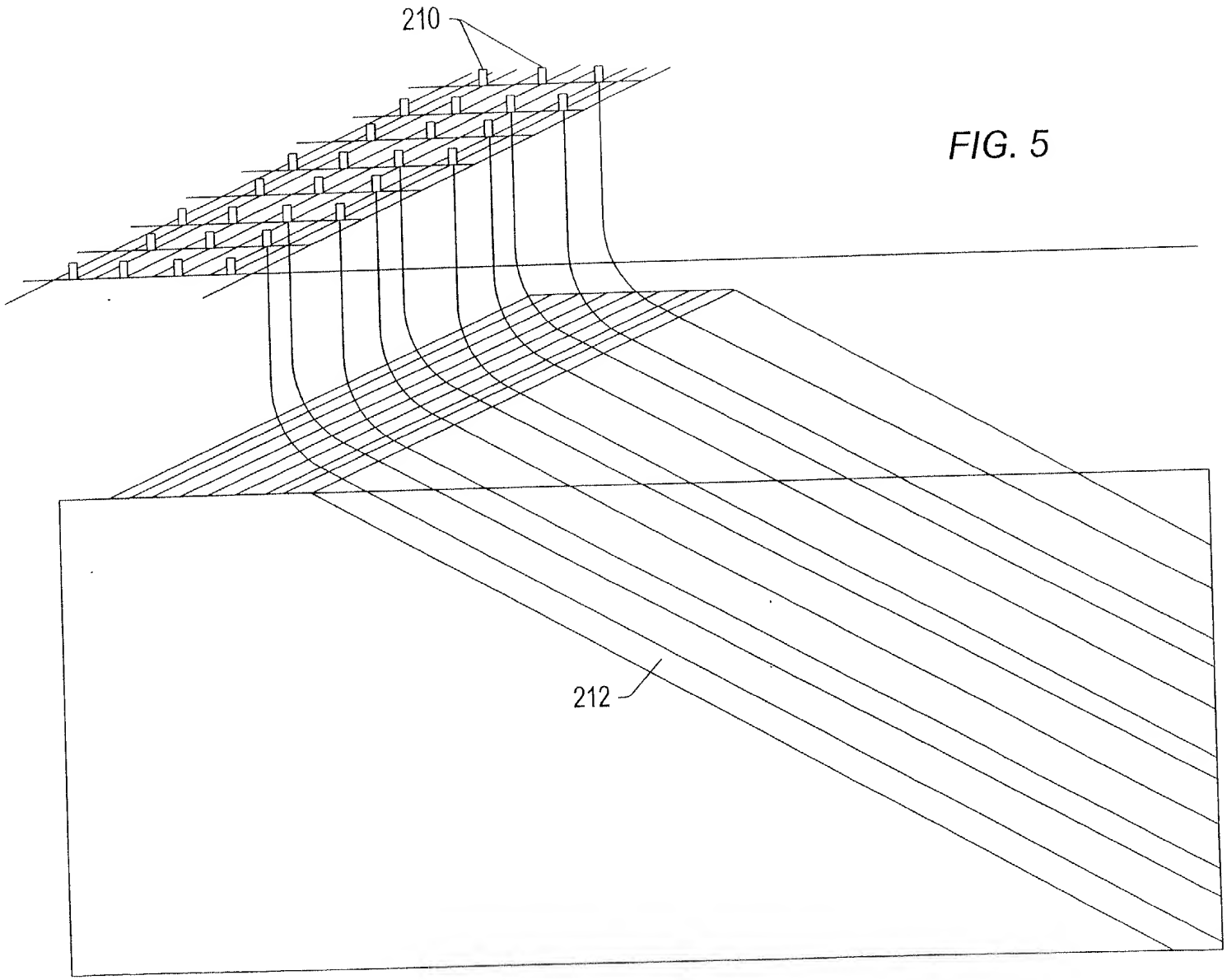

FIG. 5

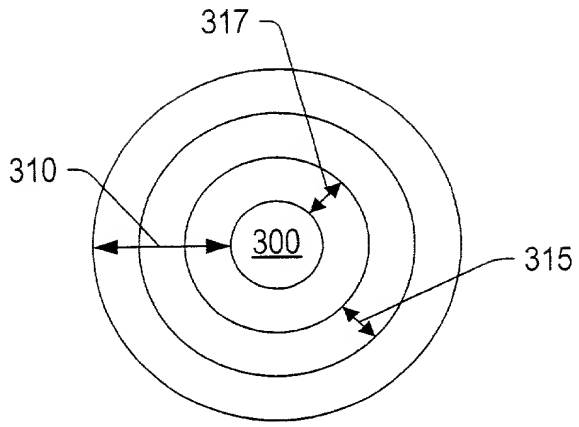

FIG. 6

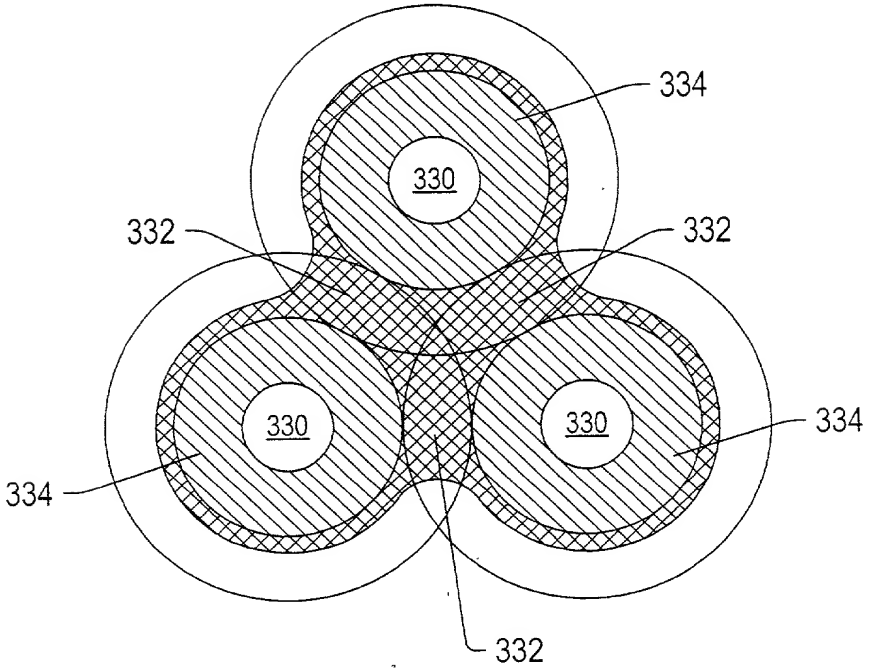

FIG. 7

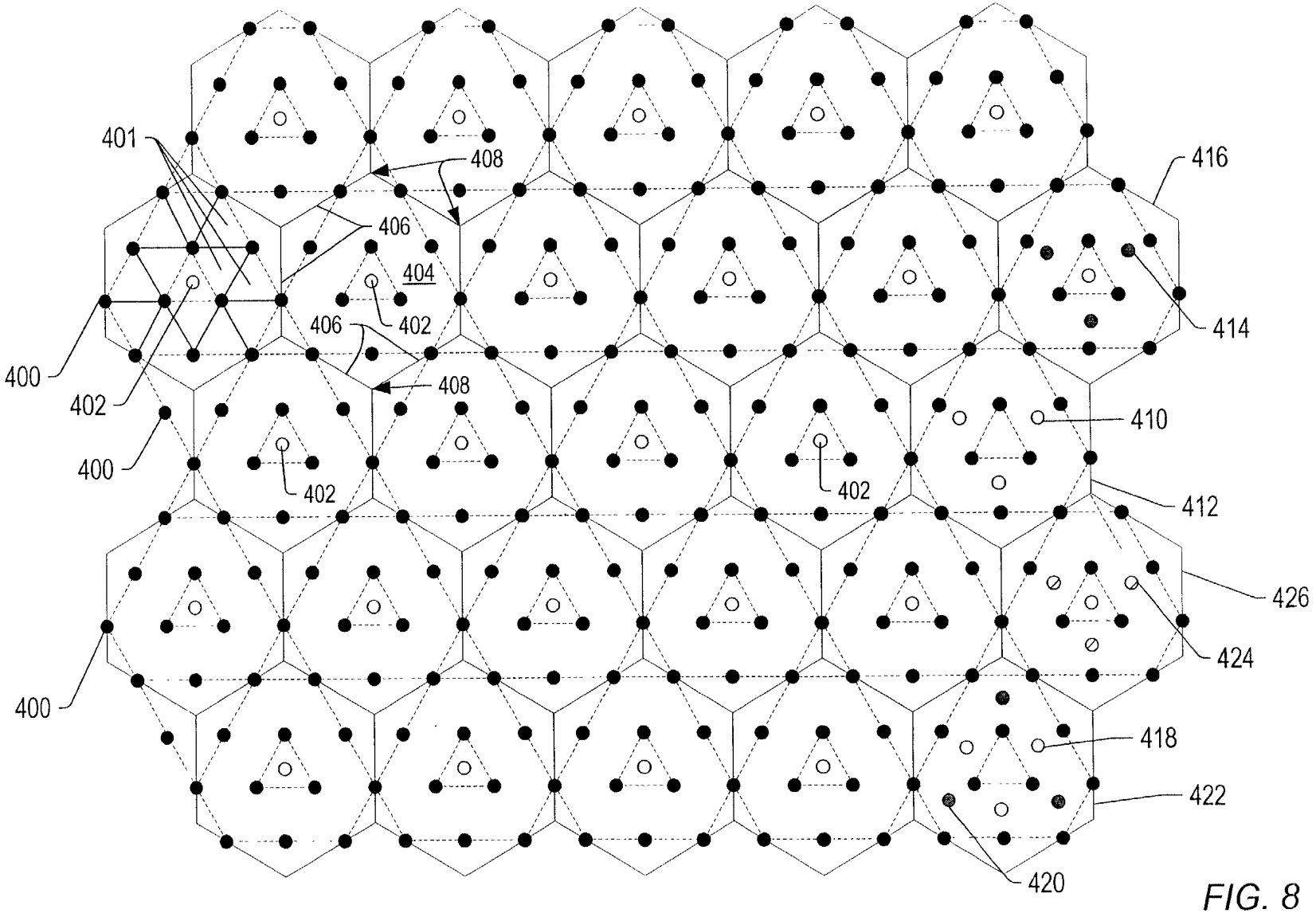
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FIG. 8

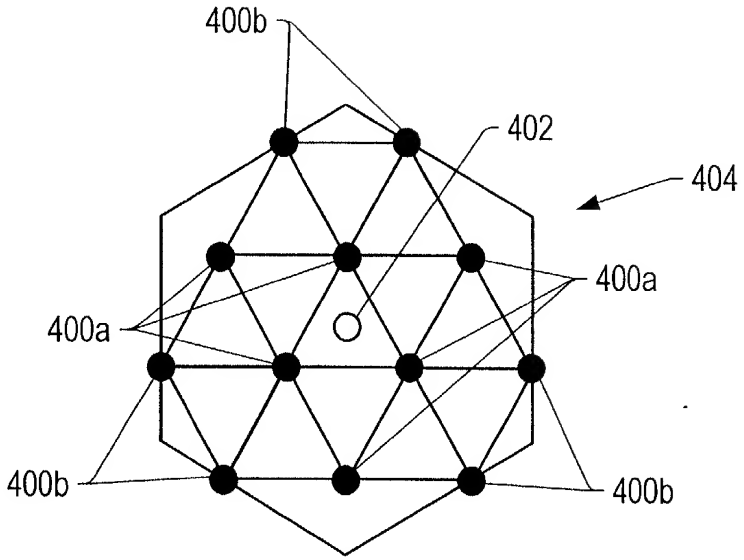
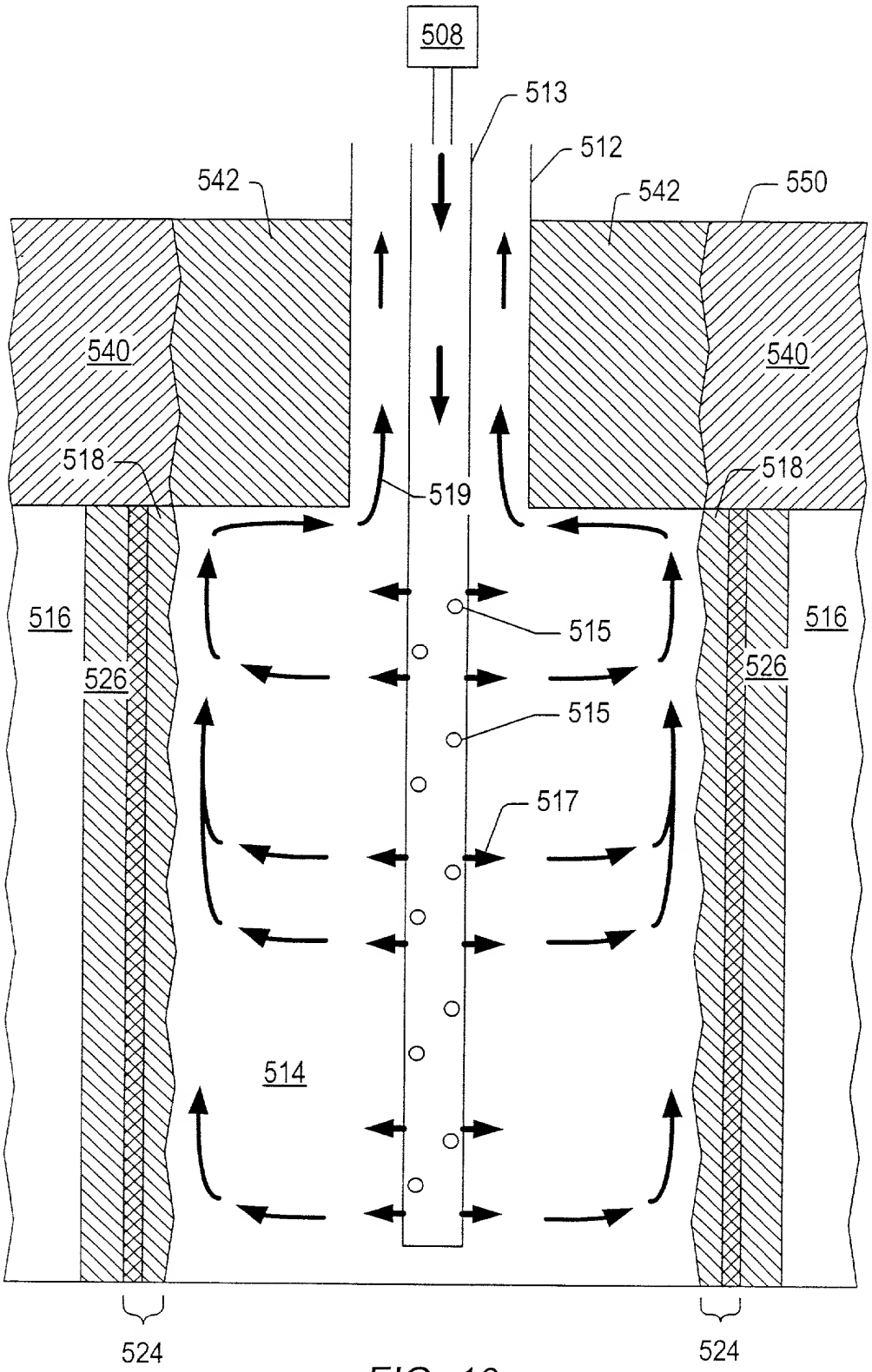


FIG. 9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524

FIG. 10

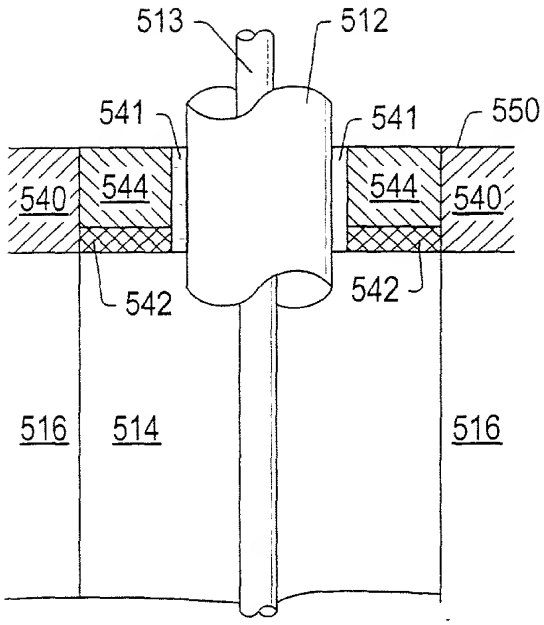
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FIG. 11

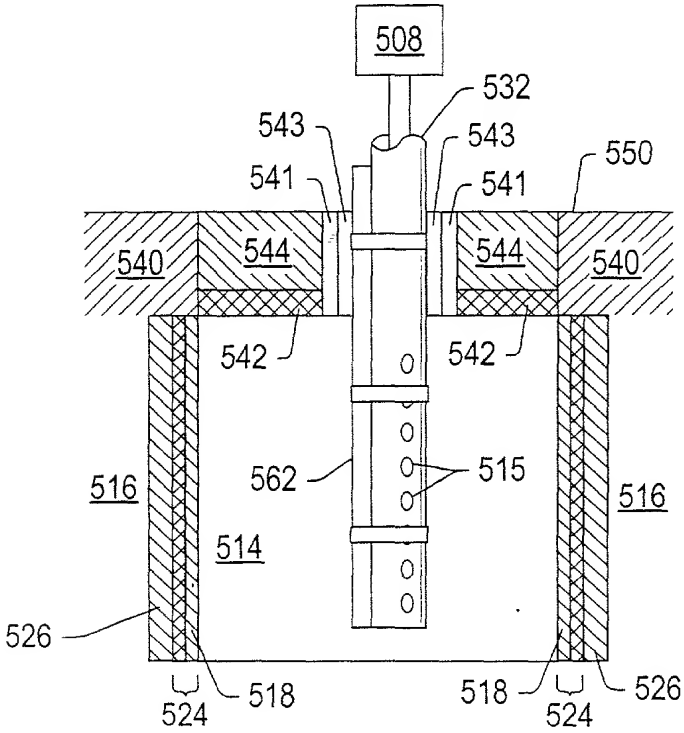
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FIG. 12

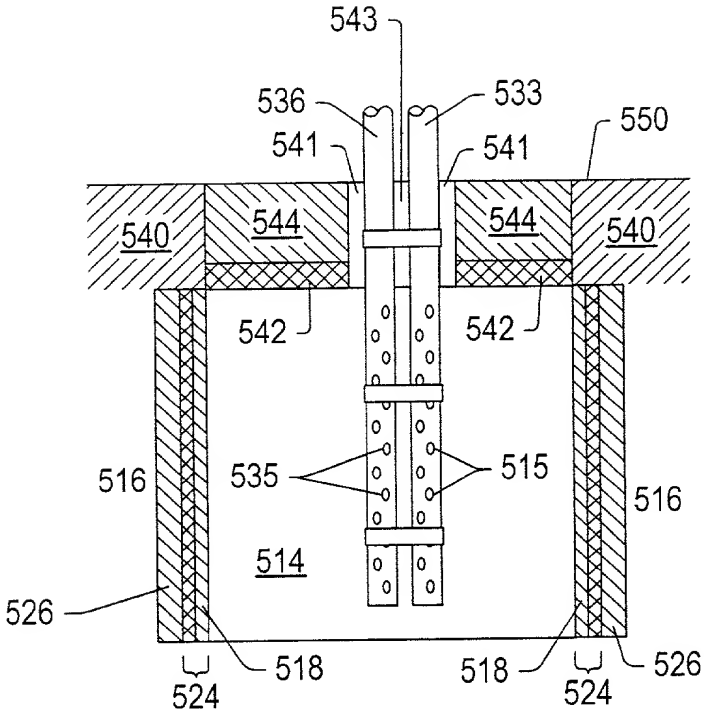
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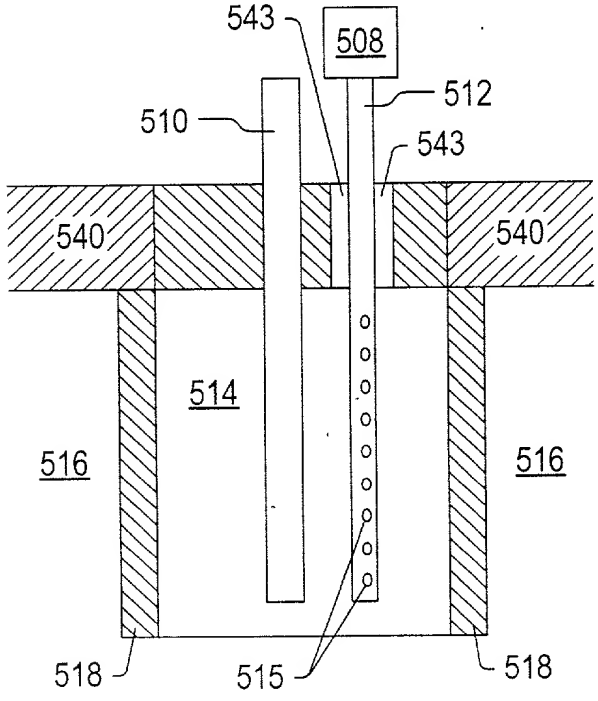
FIG. 13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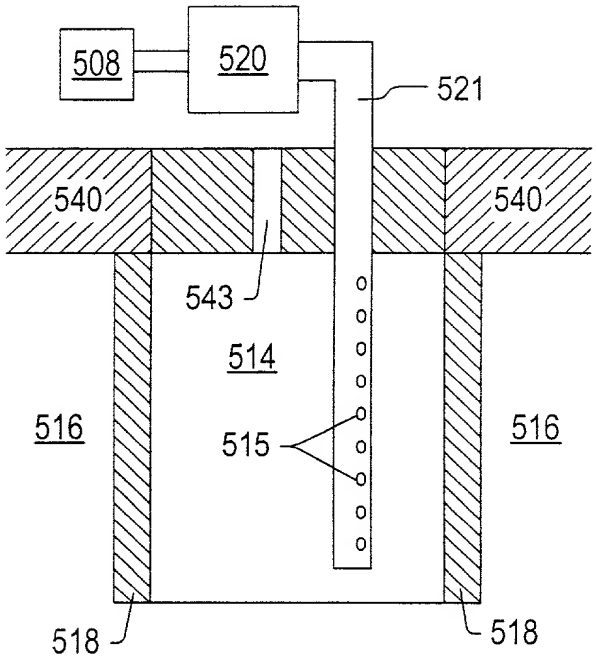
515
518

FIG. 14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543
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516
518
518

FIG. 15

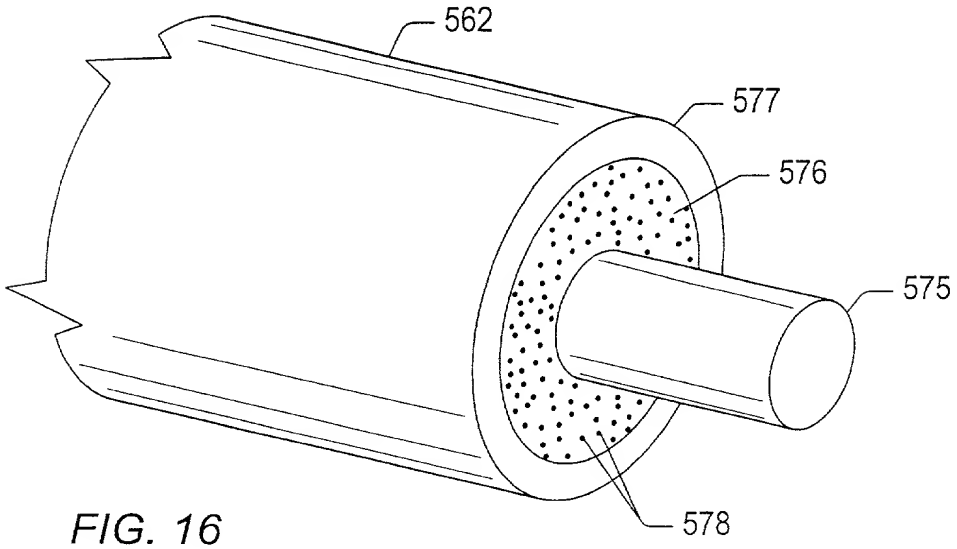

562
577
576
575
578

FIG. 16

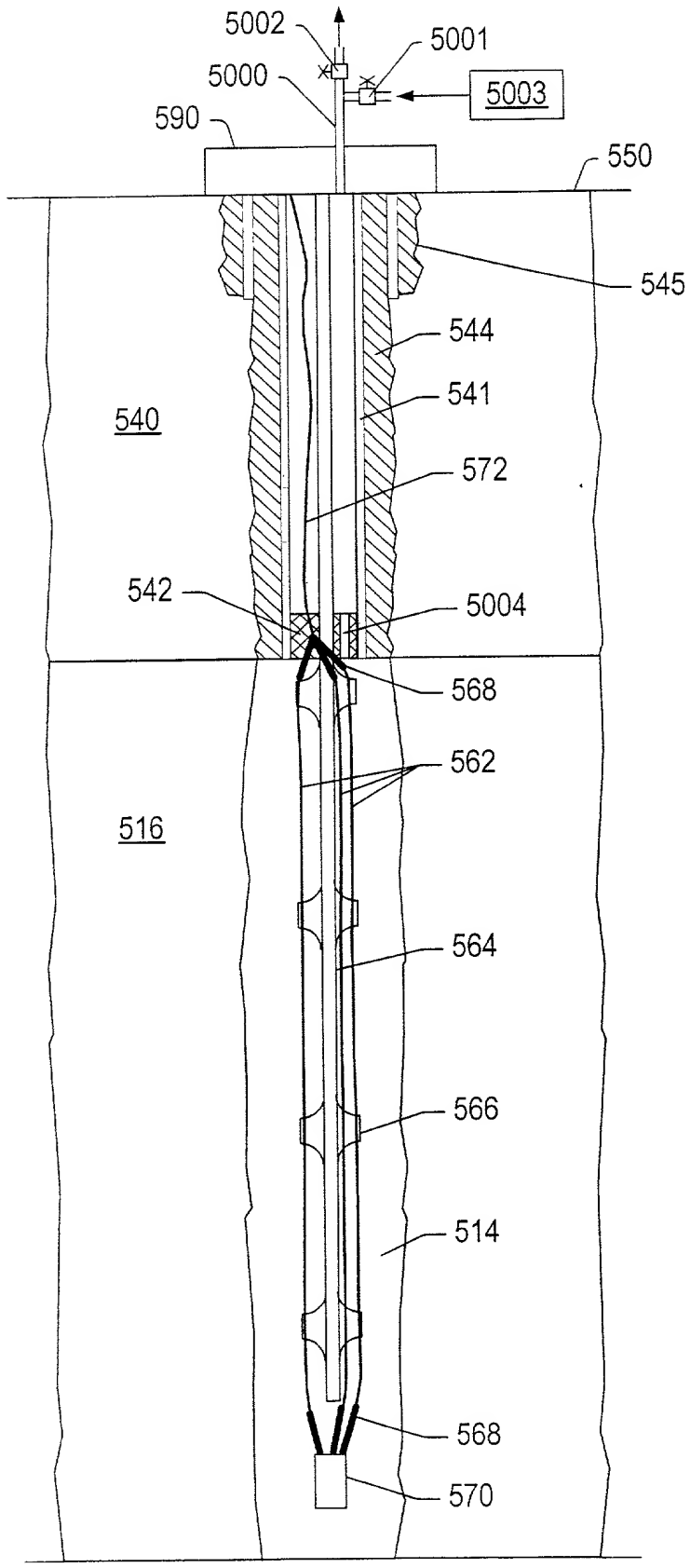


FIG. 17

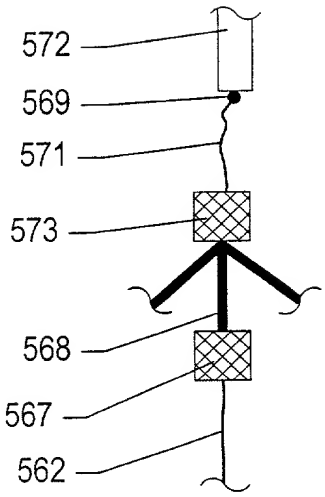
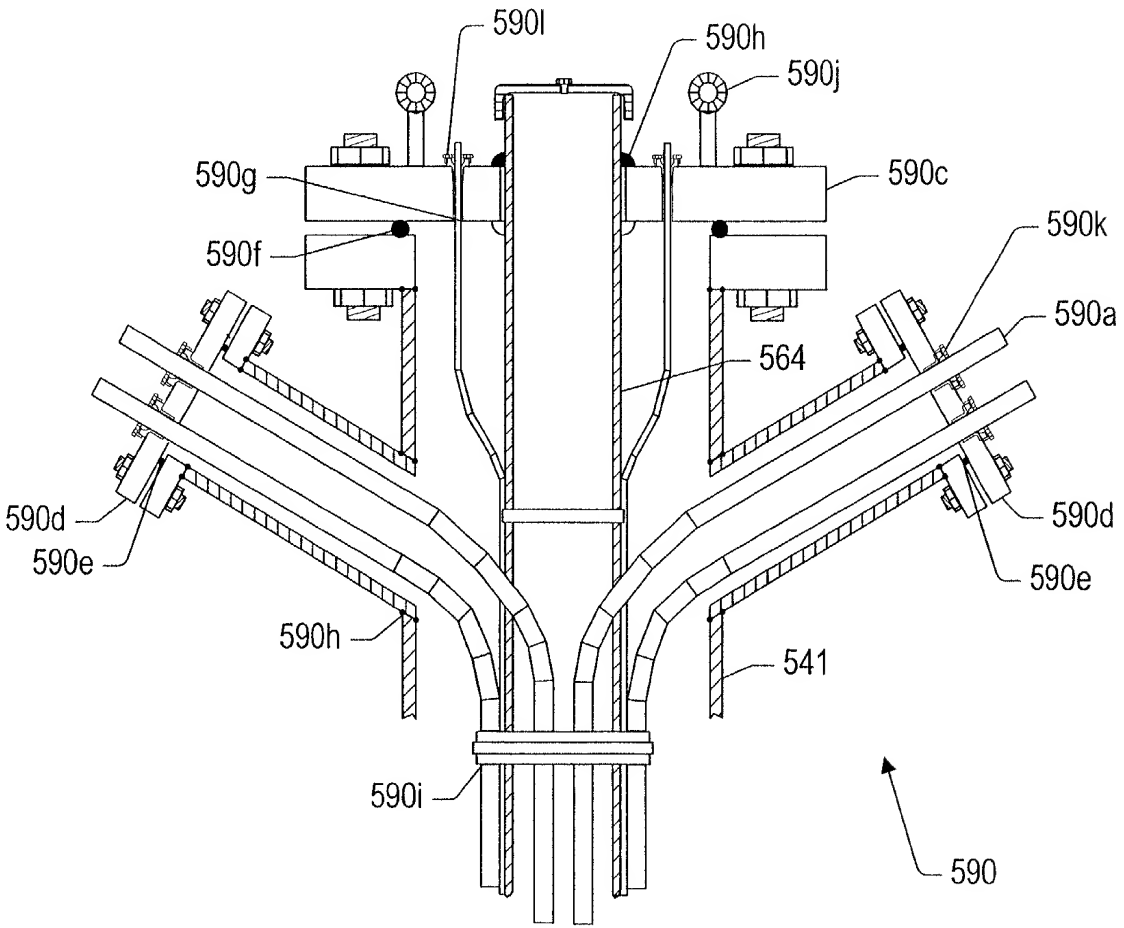


FIG. 17A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590h
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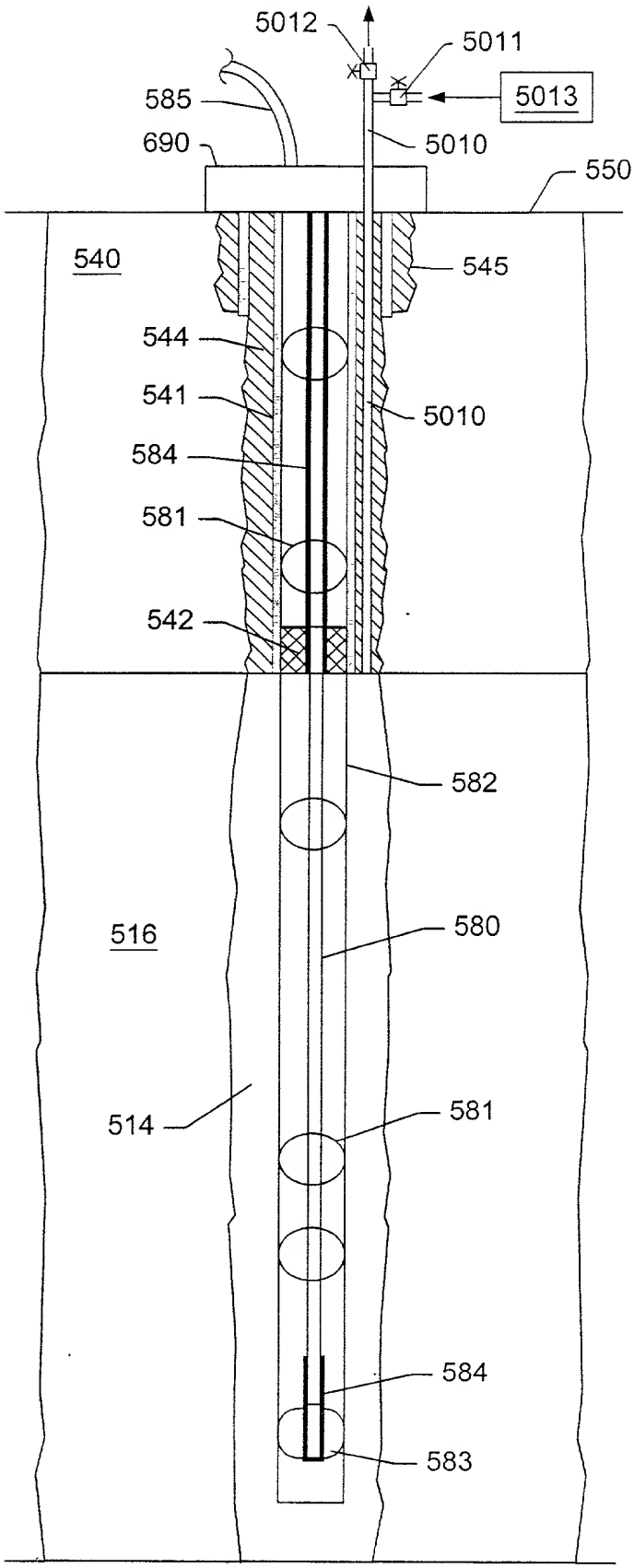
590c
590k
590f
590a
564
590d
590e
590d
590e
590h
541
590i
590

FIG. 18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5011
5013
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690
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581
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582
516
580
514
581
584
583

FIG. 19

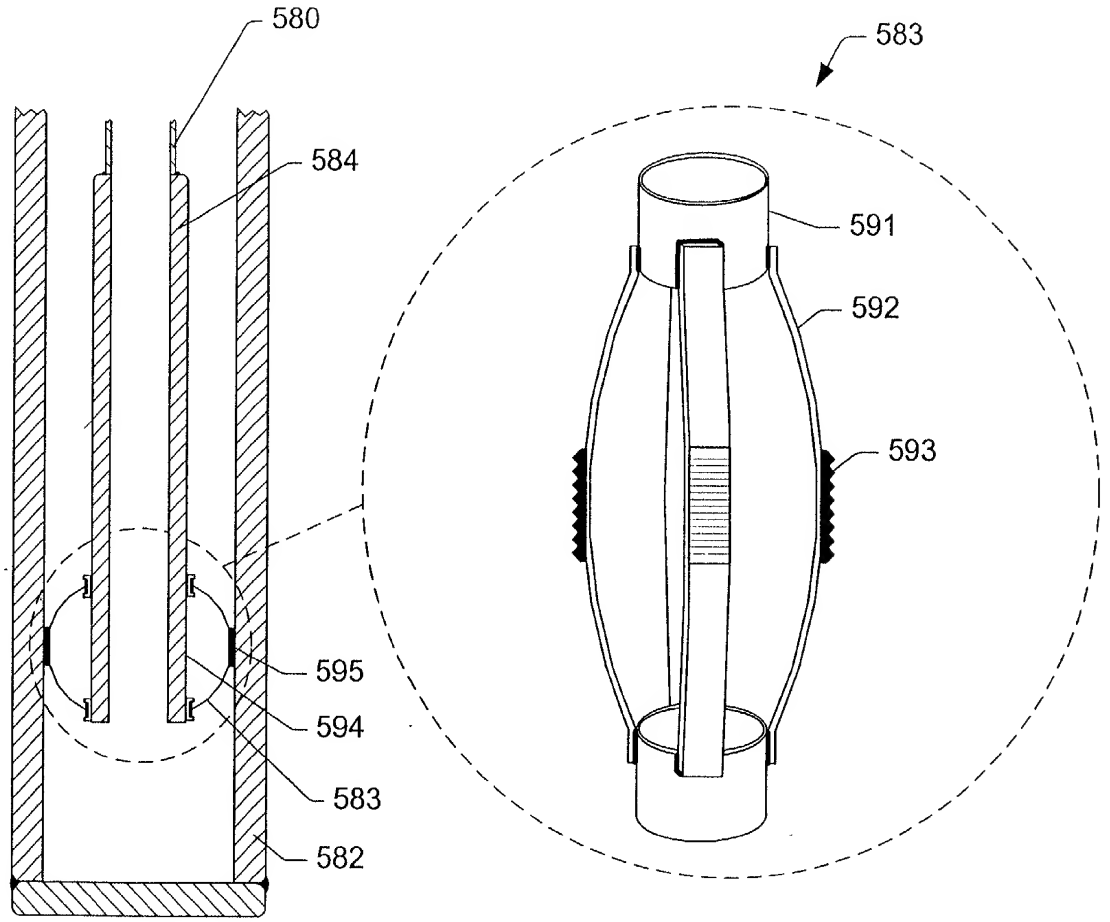
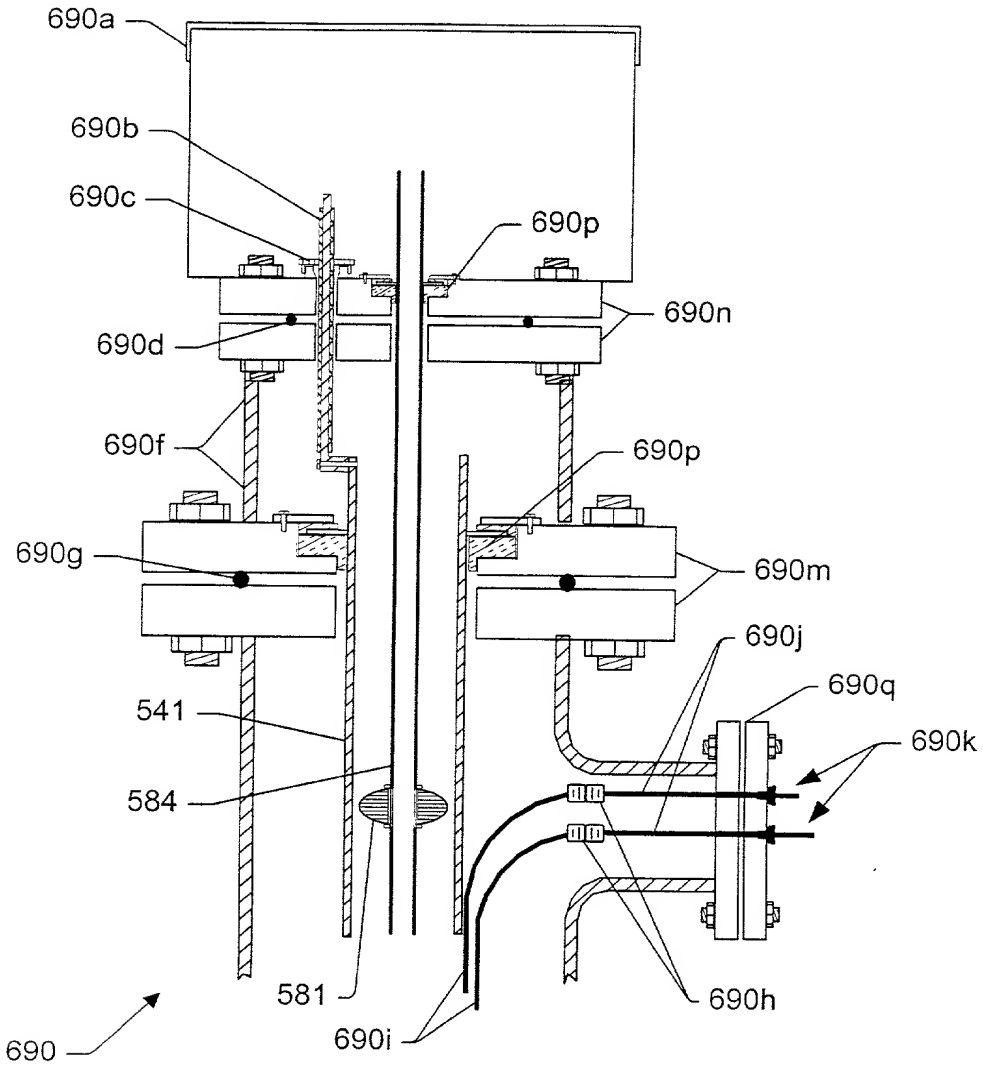


FIG. 20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690c
690p
690n
690d
690f
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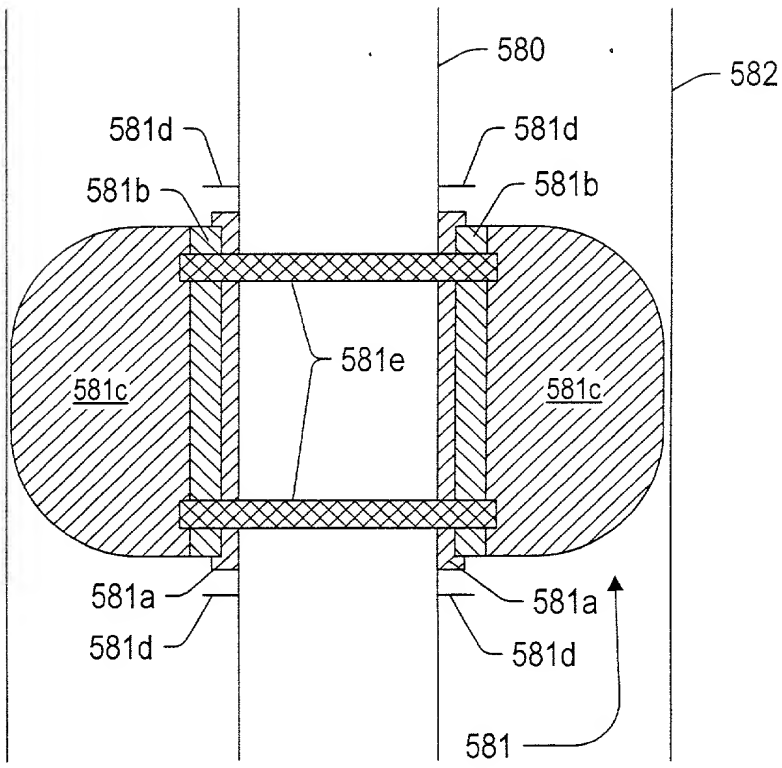
690g
690m
690j
690q
690k
541
584
581
690h
690i
690

FIG. 21


580
582
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581d
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581b
581e
581c
581c
581a
581a
581d
581d
581

FIG. 22

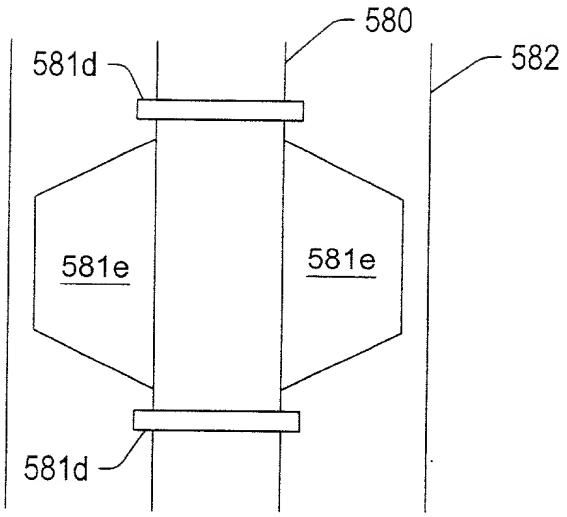


FIG. 23a

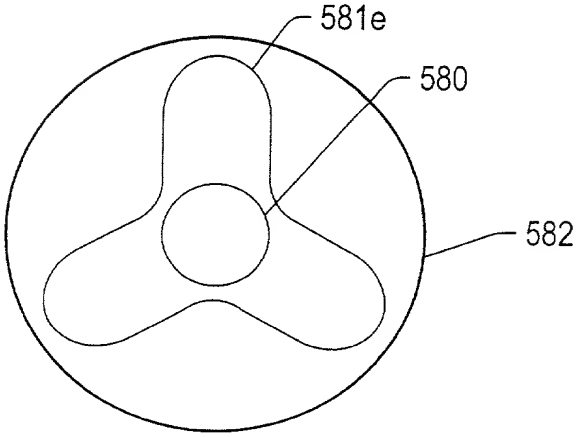


FIG. 23b

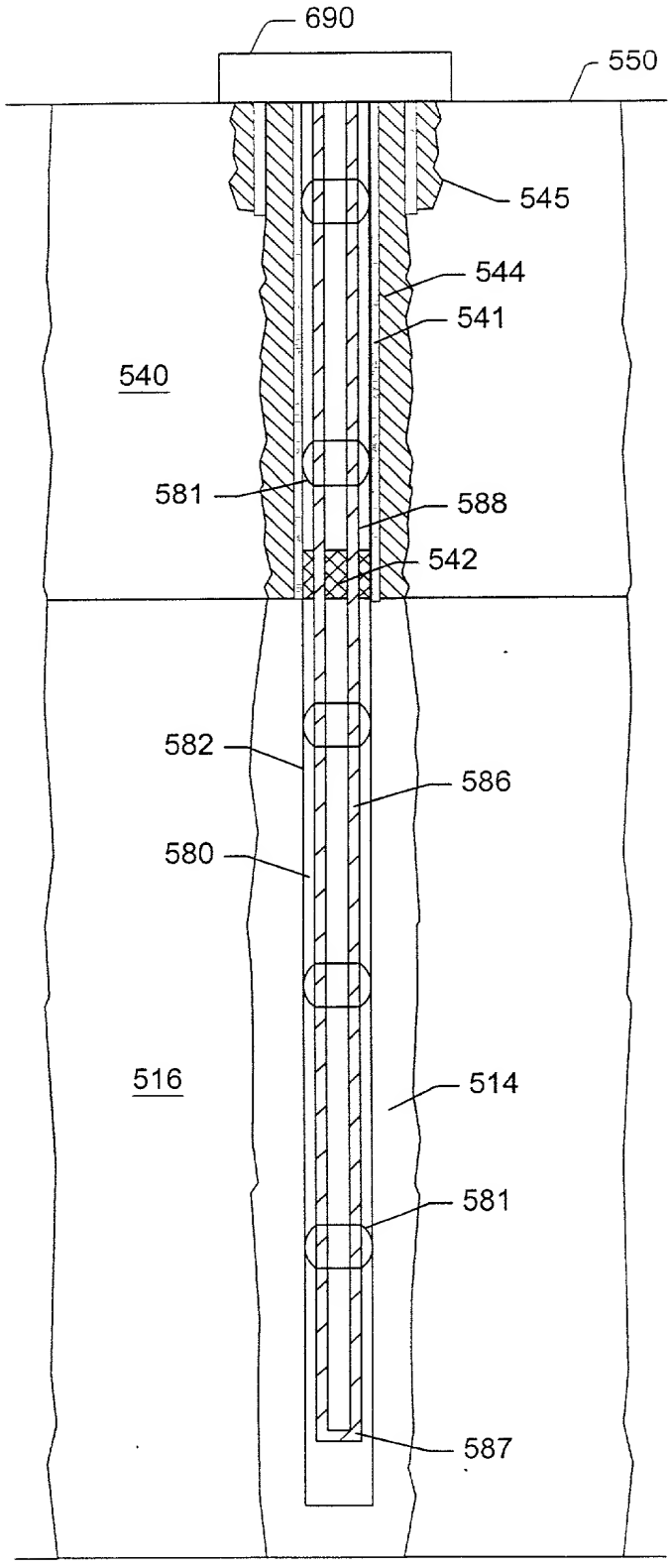
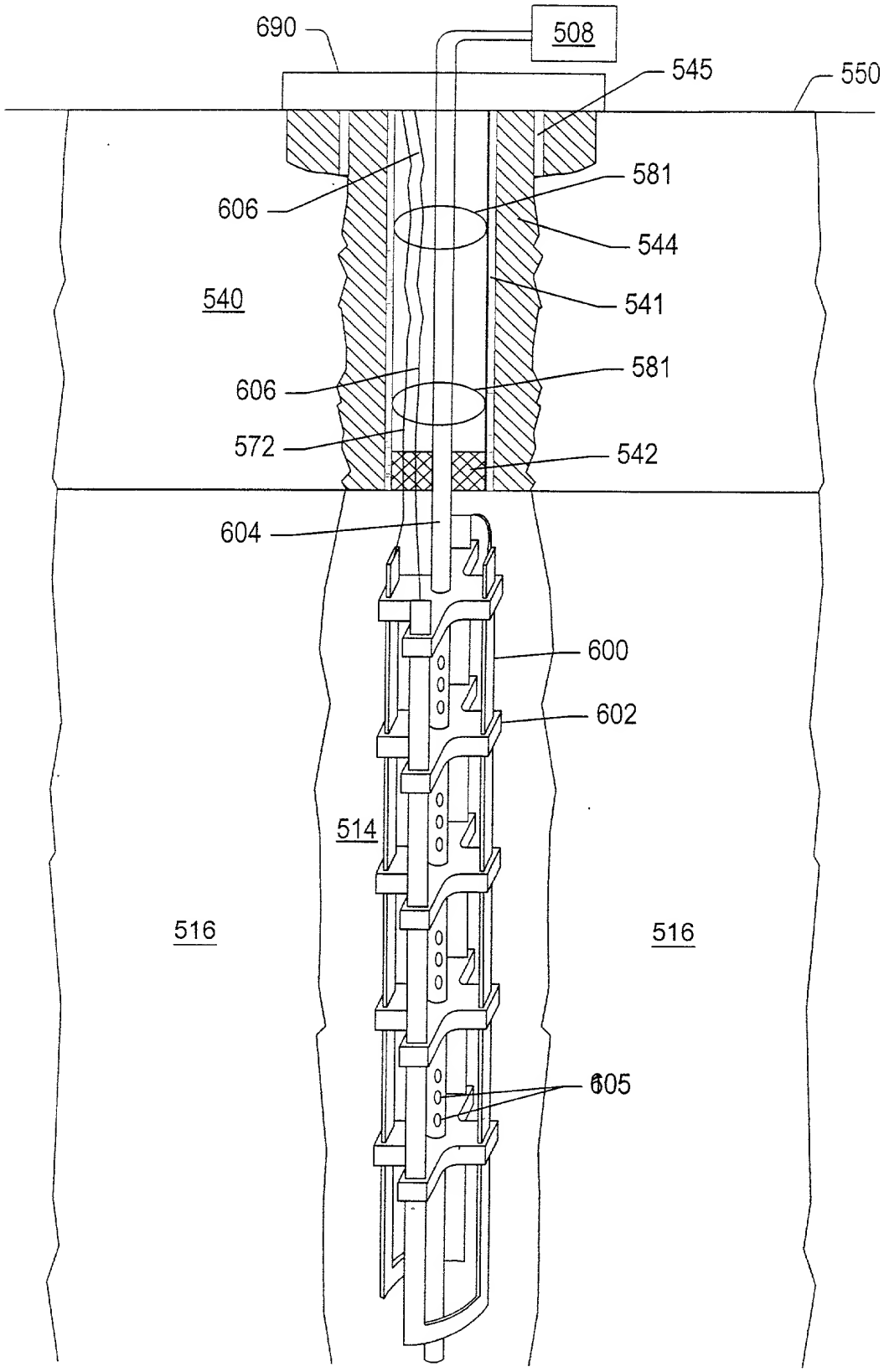


Fig. 24


690
508
545
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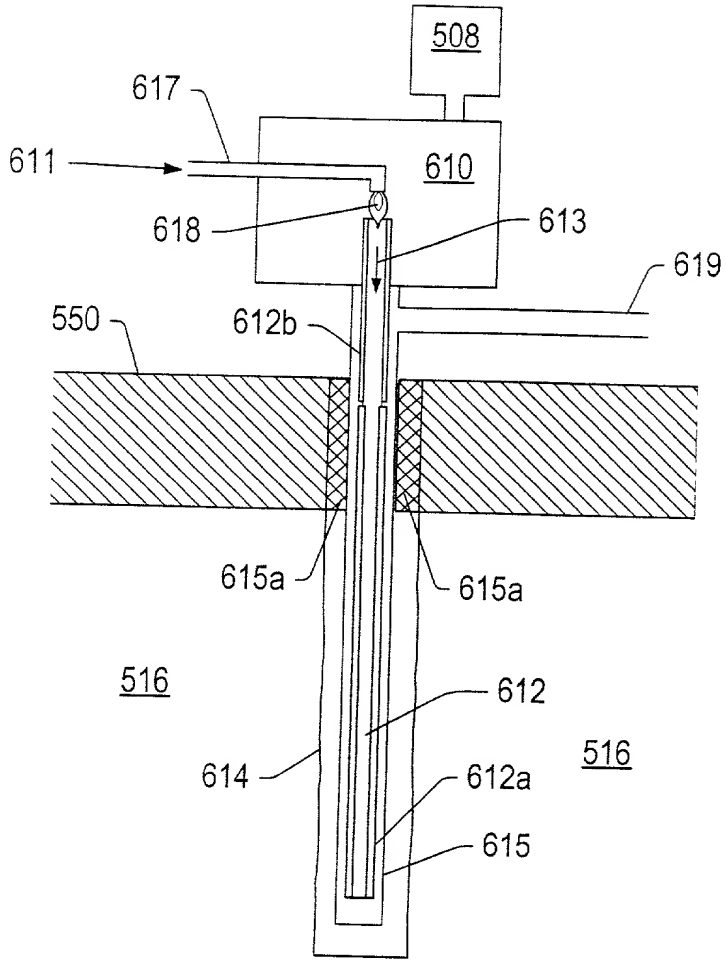
516
605

FIG. 25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617
611
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618
613
619
550
612b
615a
615a
516
612
516
614
612a
615

FIG. 26

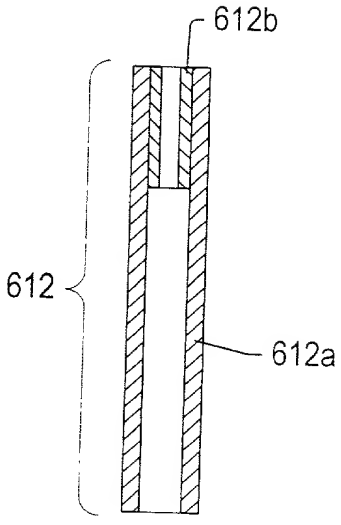

612b
612
612a

FIG. 27

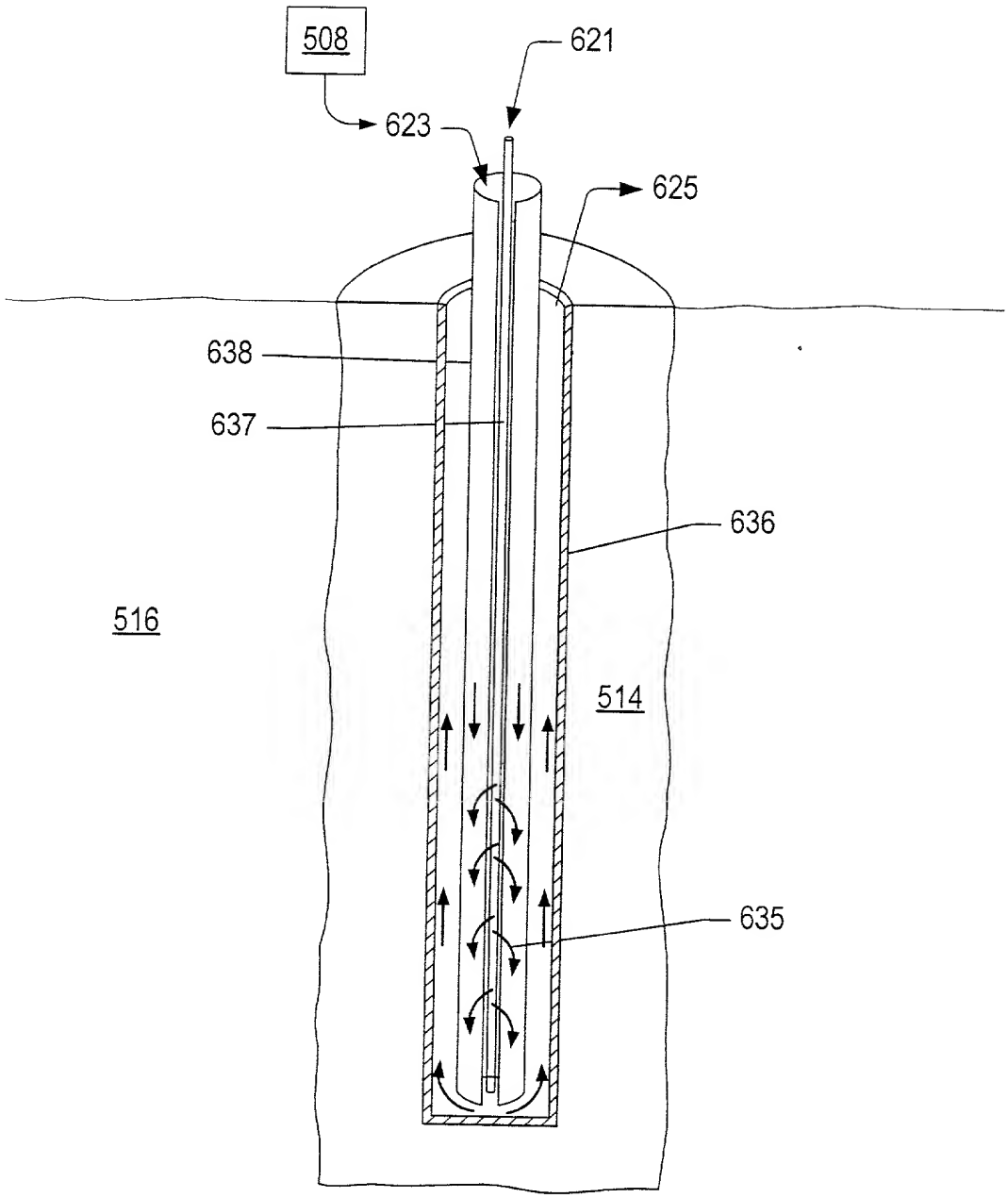
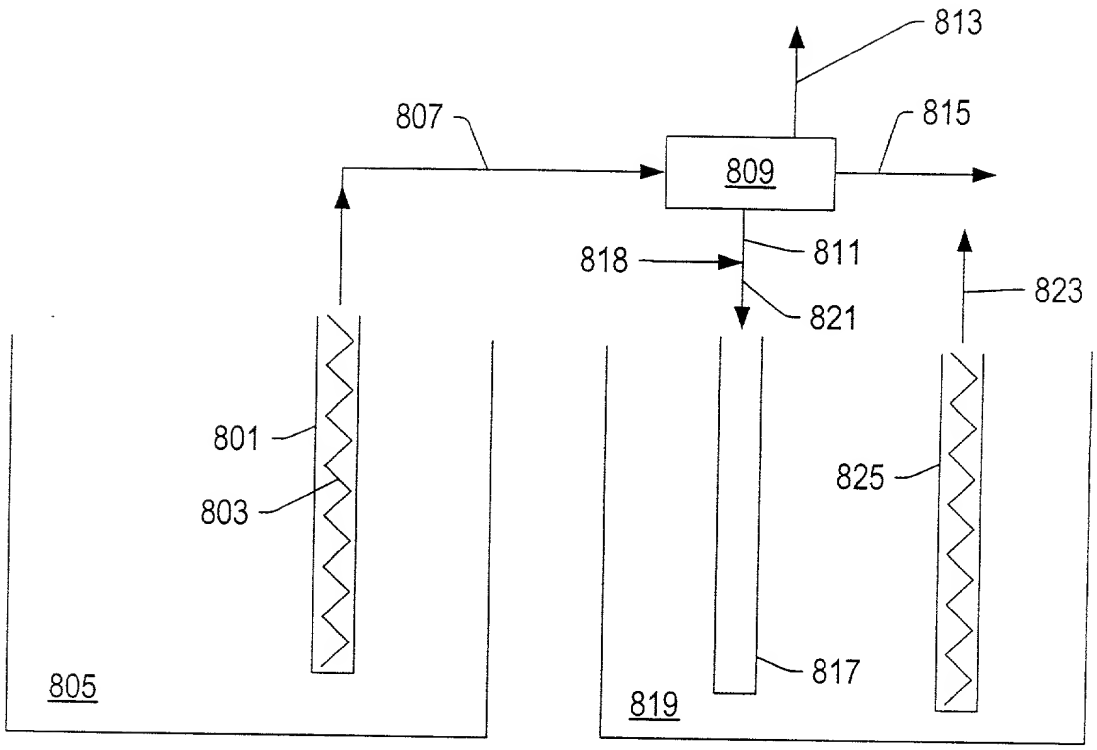


FIG. 28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817
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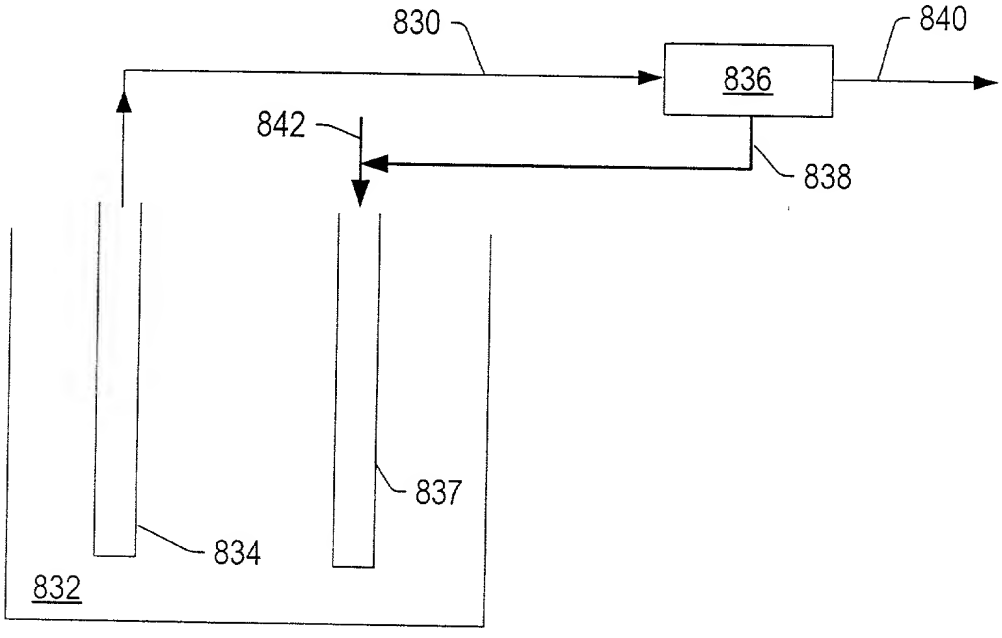
FIG. 29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837
834
832

FIG. 30

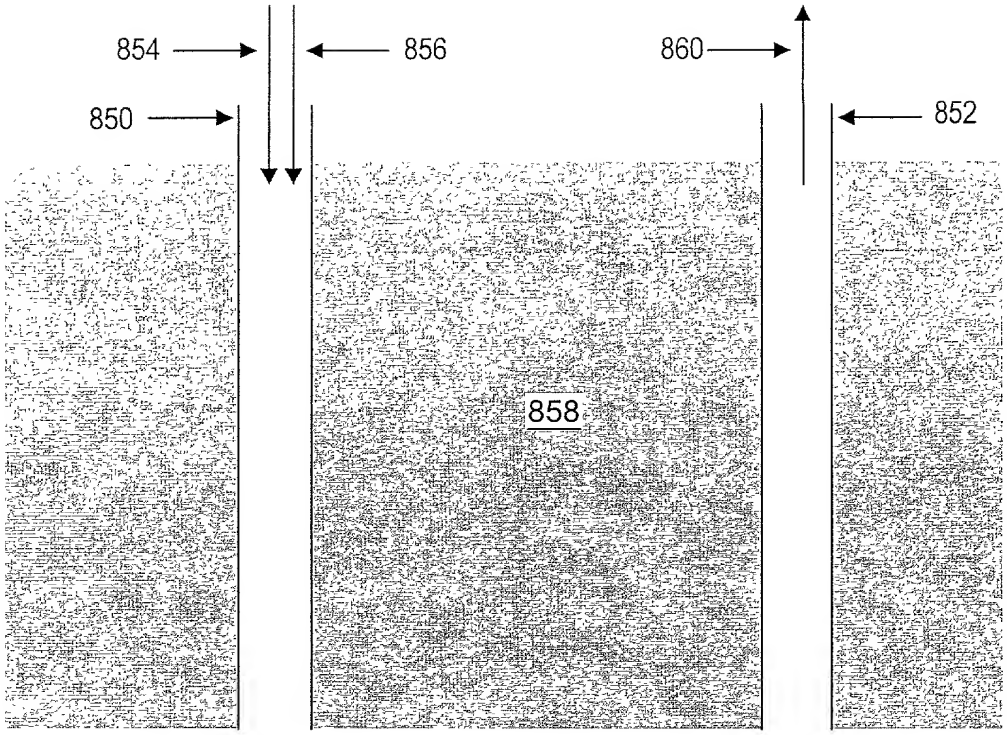

FIG. 31

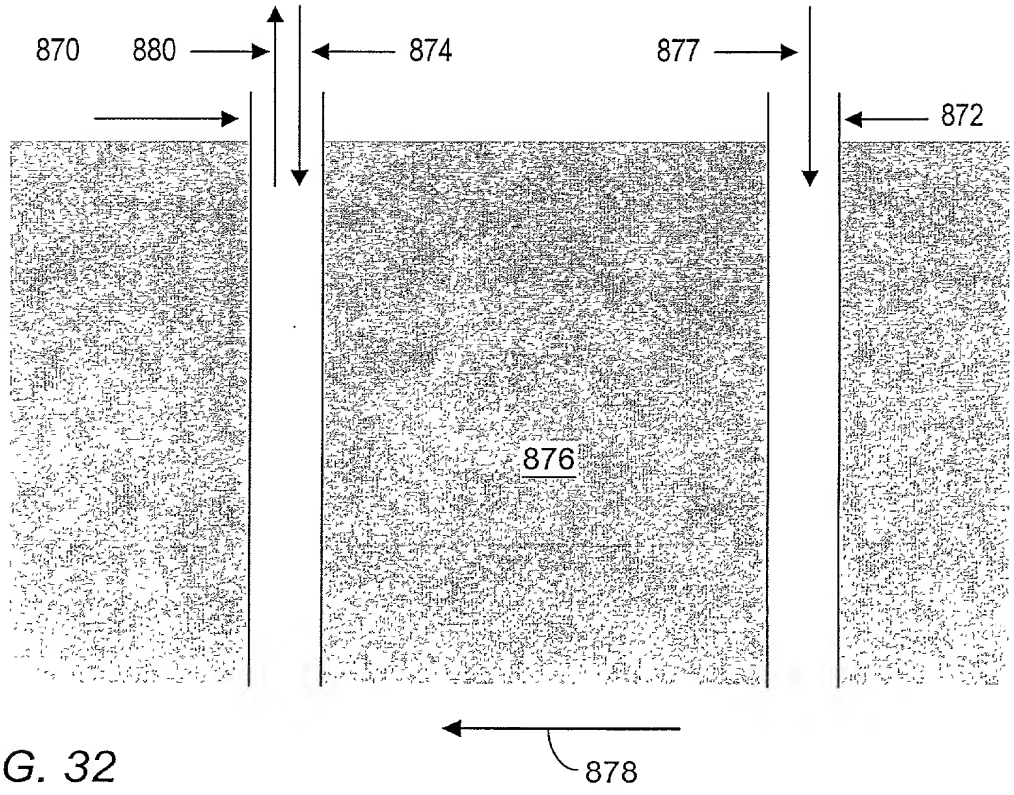

FIG. 32

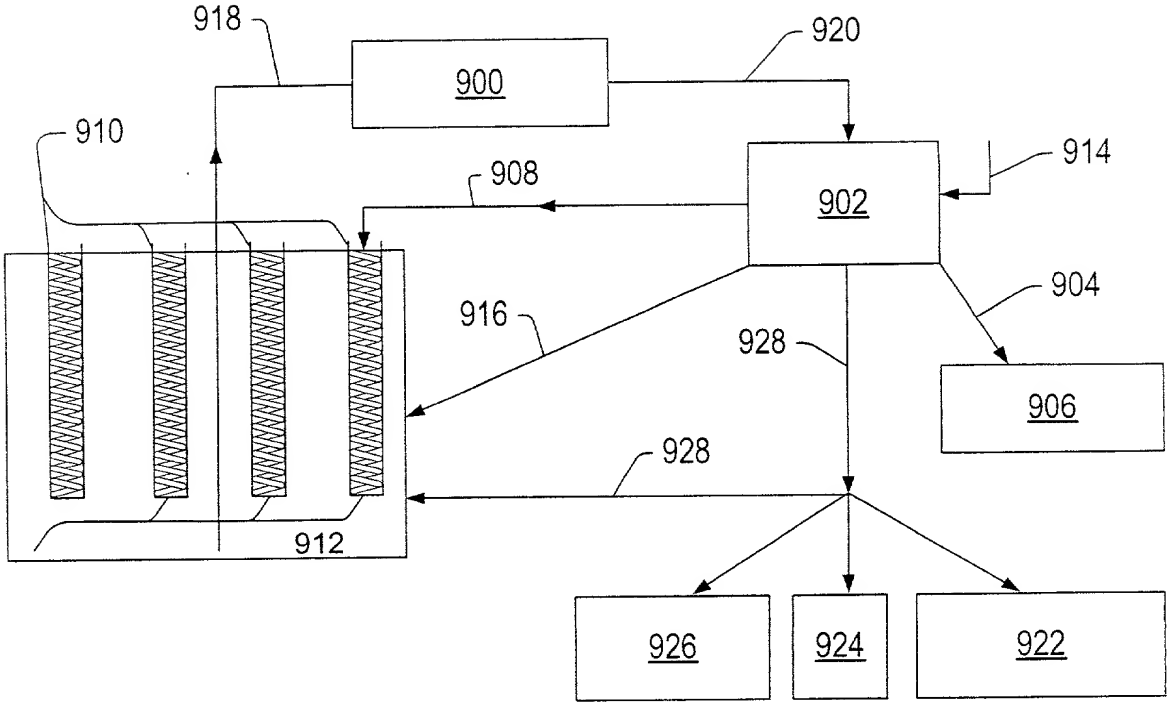
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FIG. 33

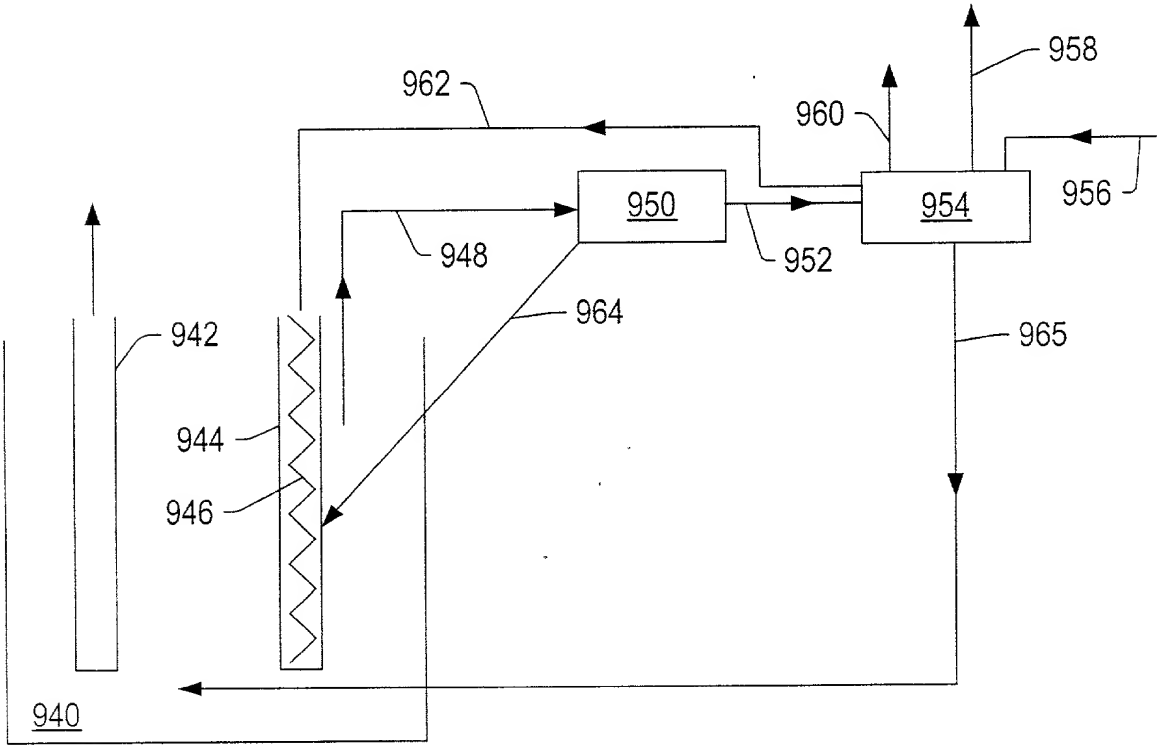
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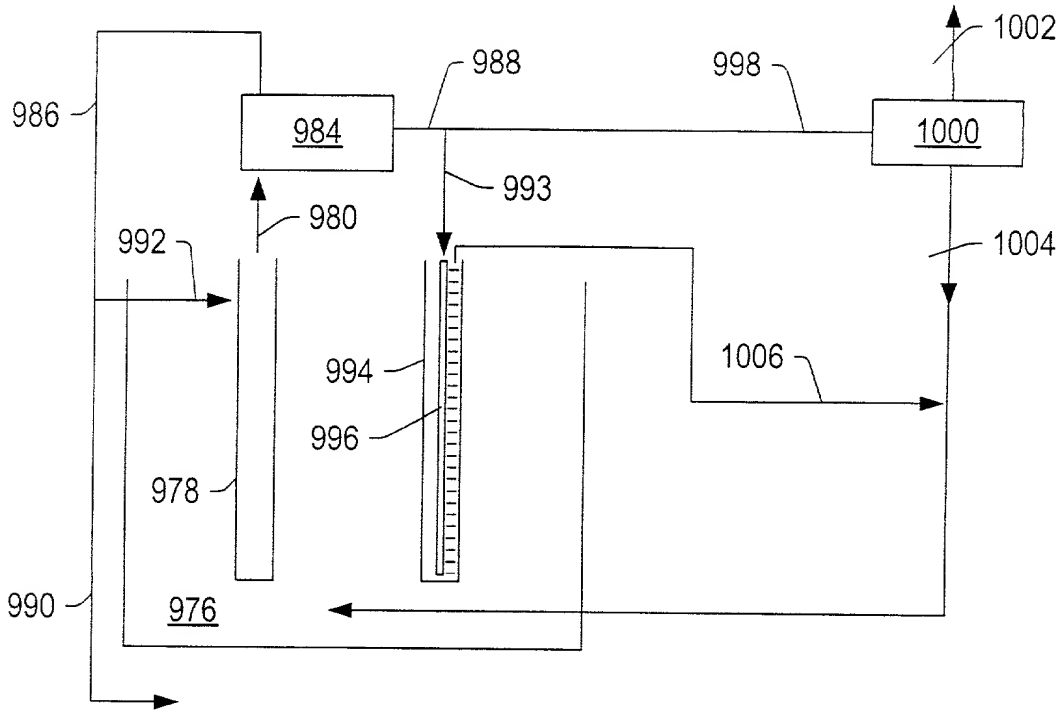
FIG. 34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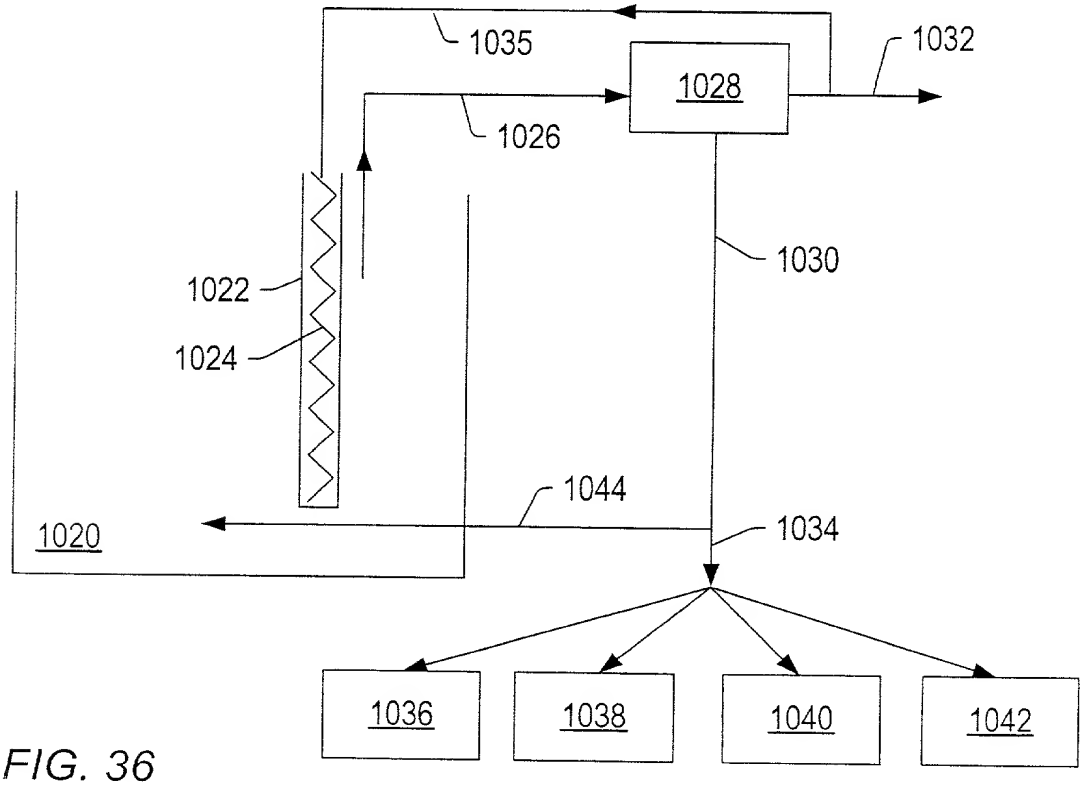
976

FIG. 35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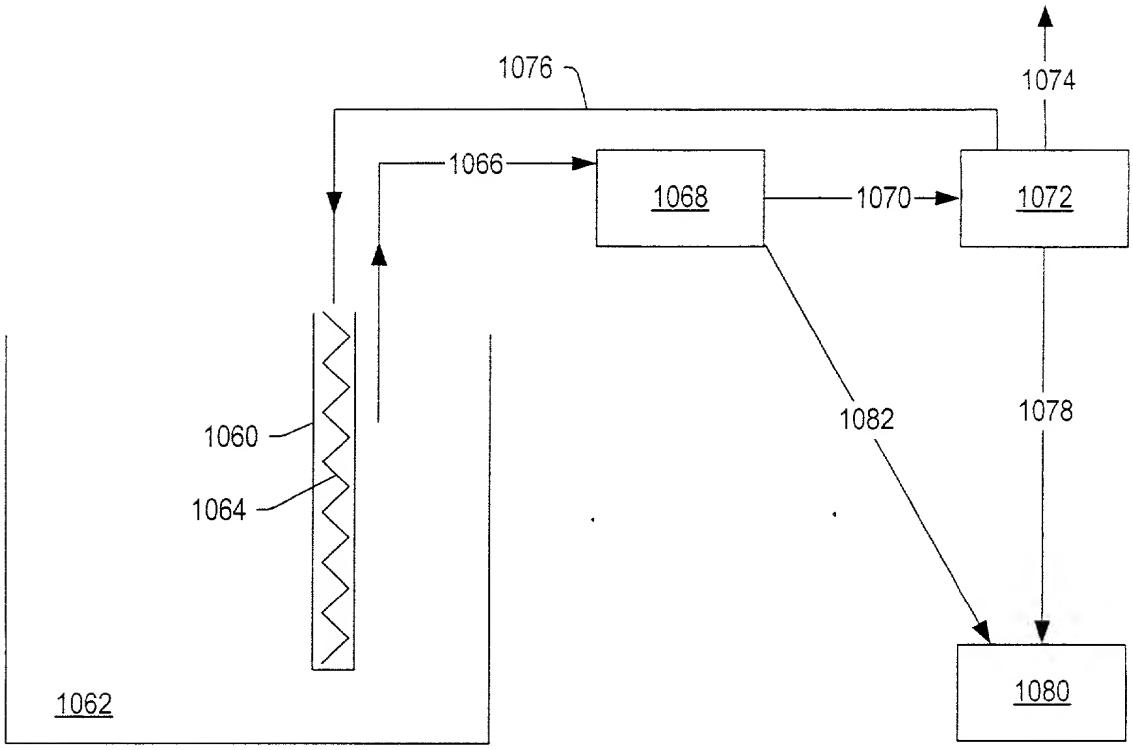
1042

FIG. 36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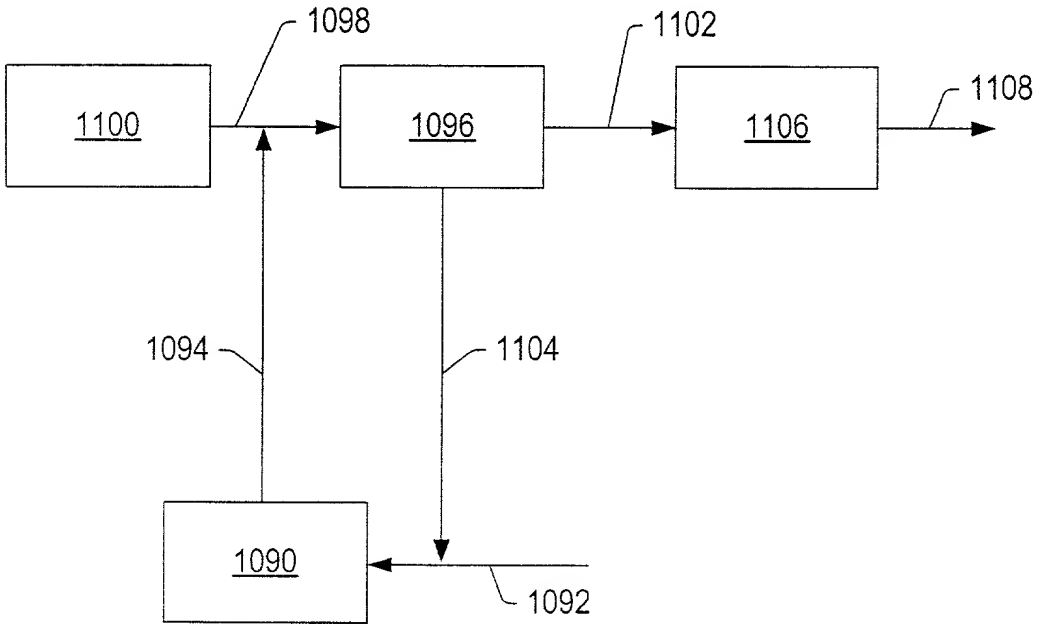
1062
1080

FIG. 37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1106
1108
1094
1104
1090
1092

FIG. 38

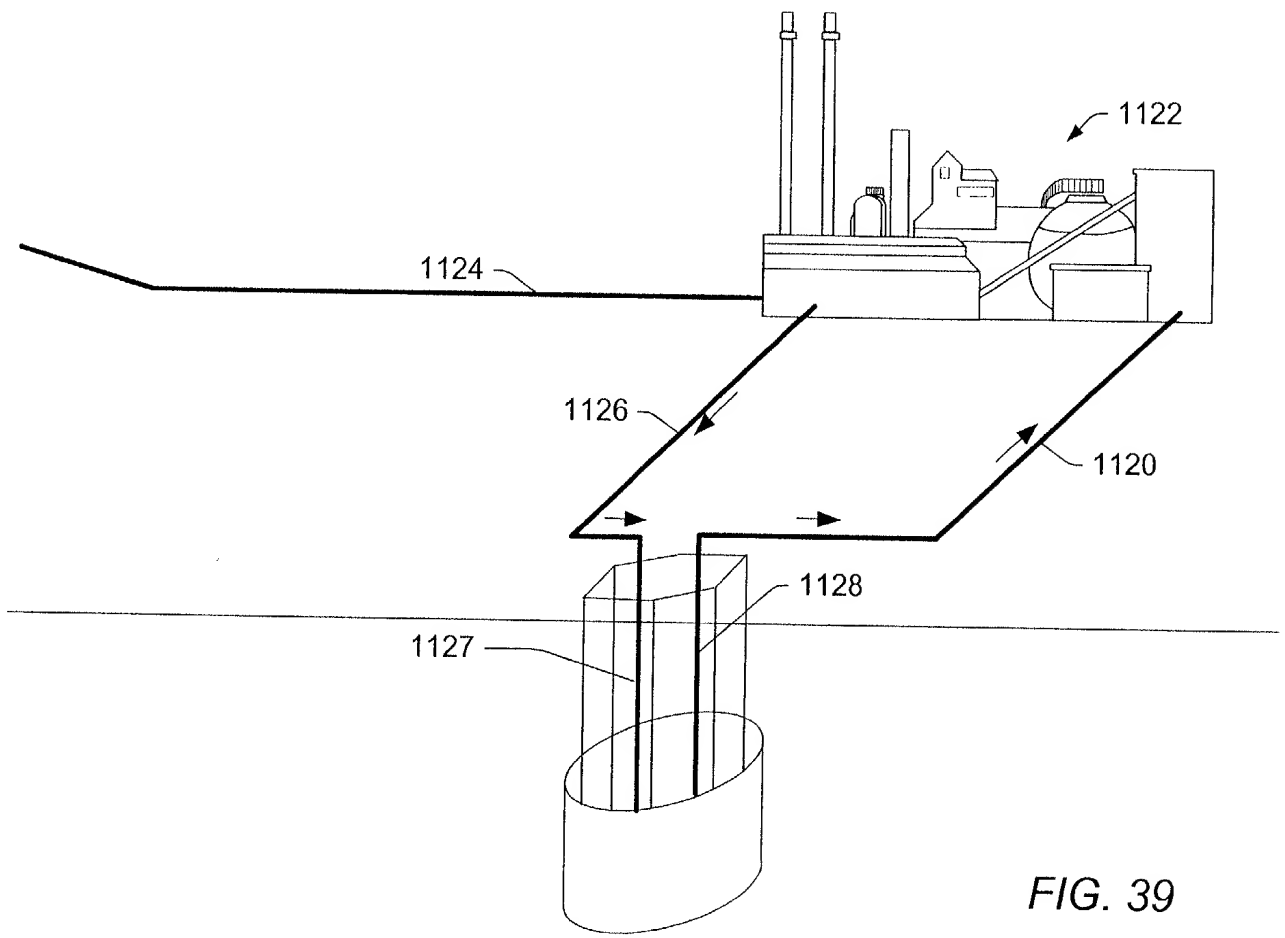

FIG. 39

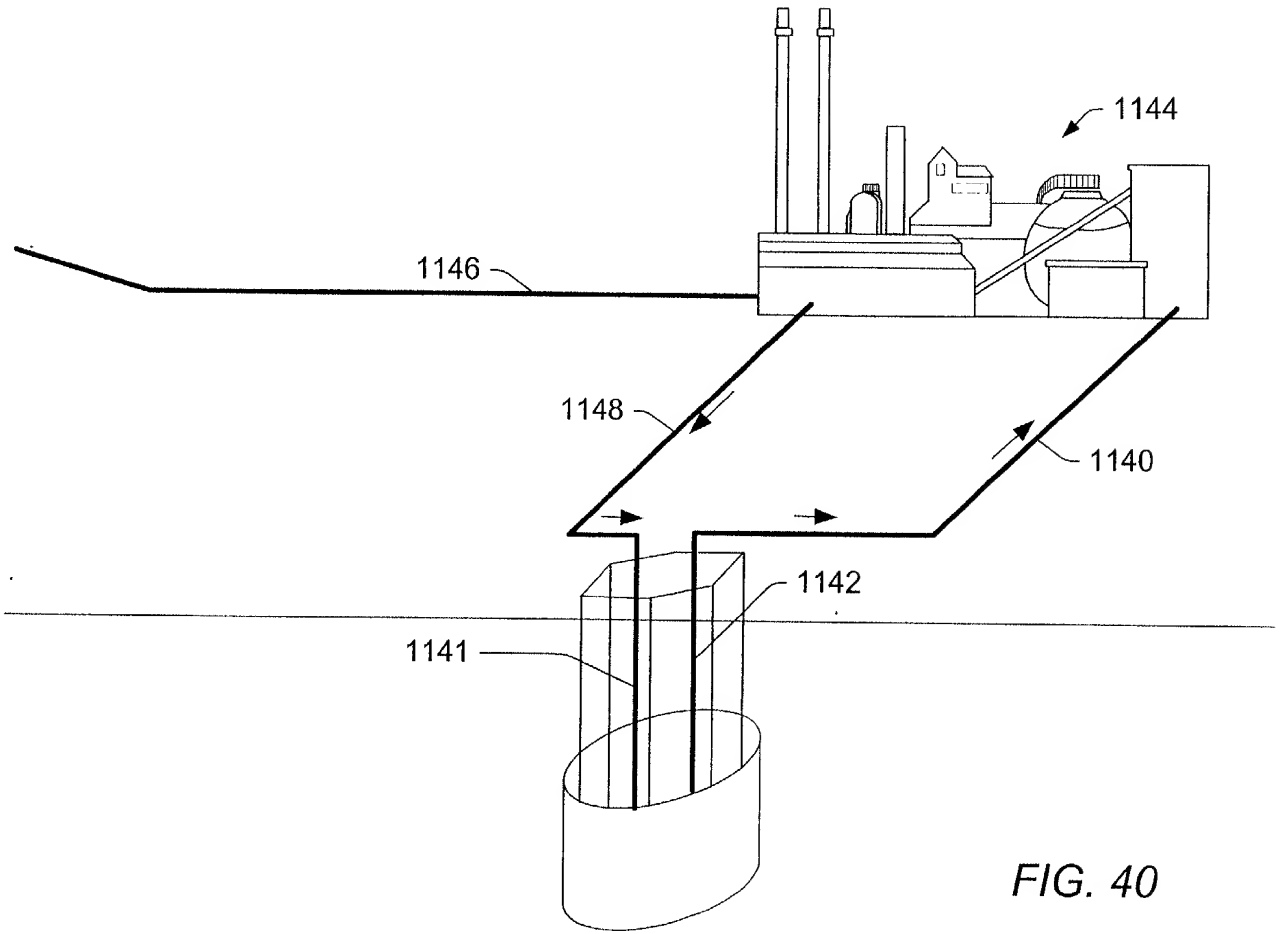

FIG. 40

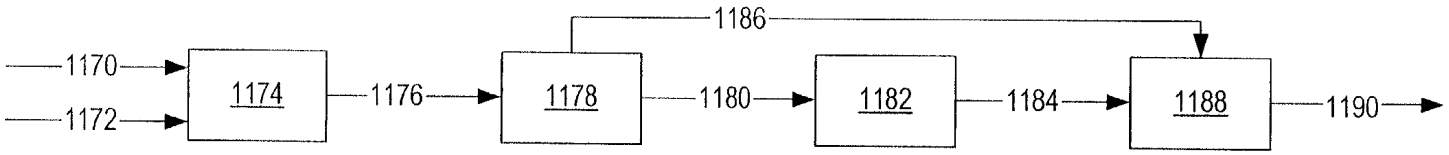

FIG. 41

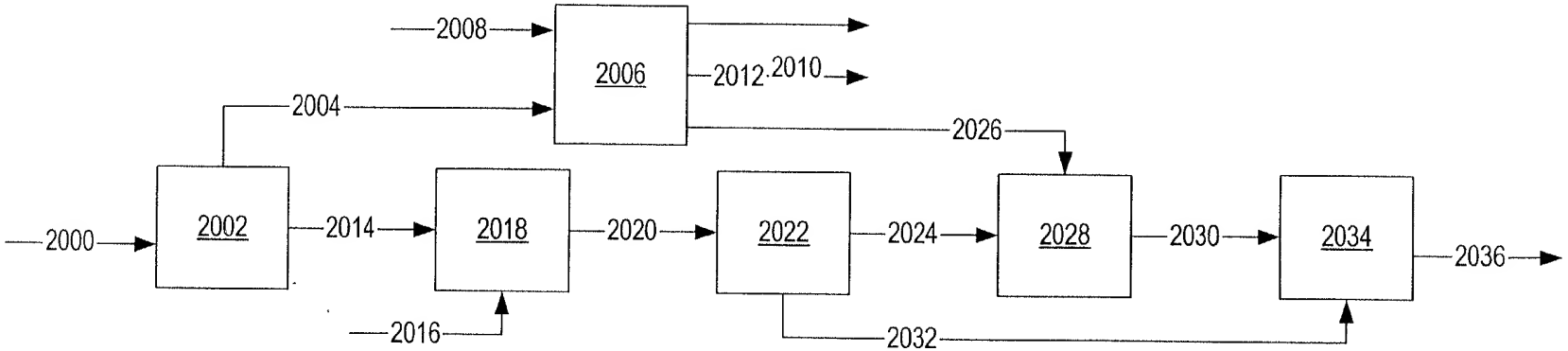

FIG. 42

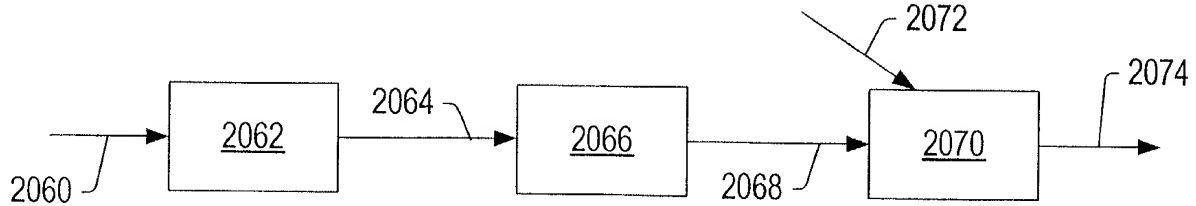

FIG. 43

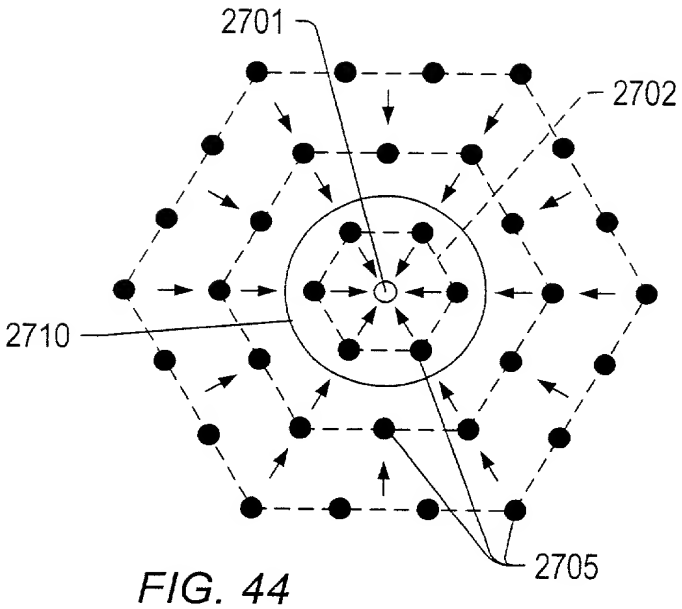

FIG. 44

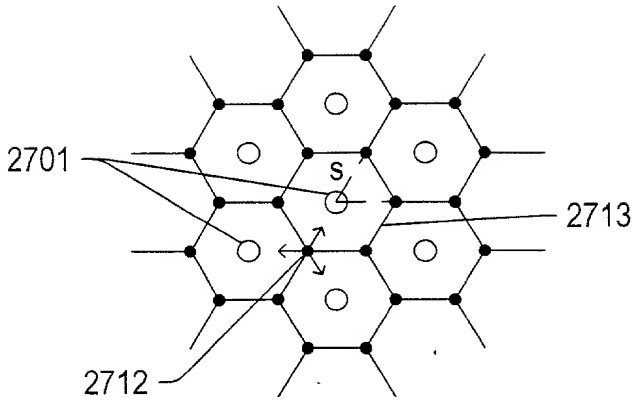

FIG. 45

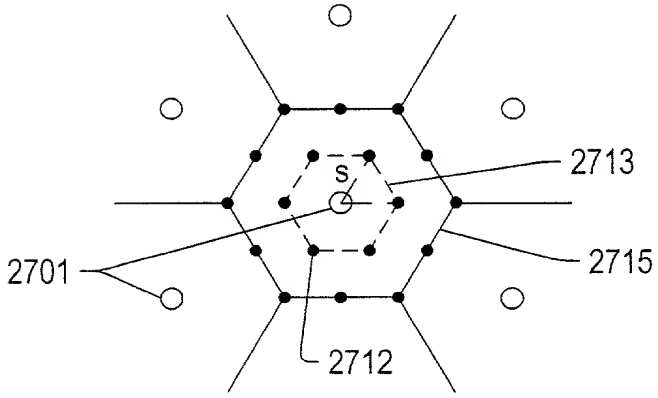

FIG. 46

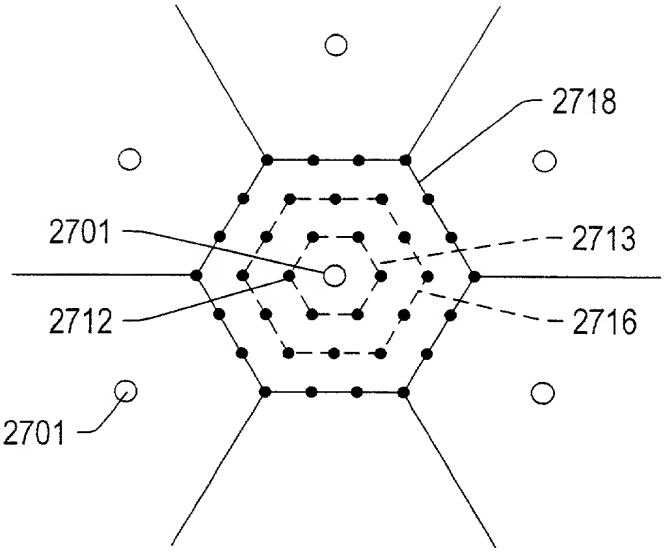

FIG.47

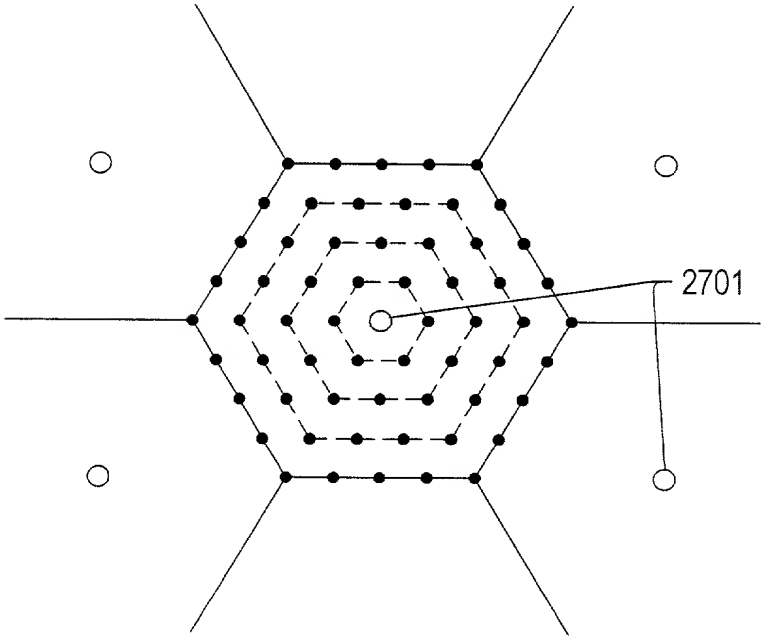

FIG. 48

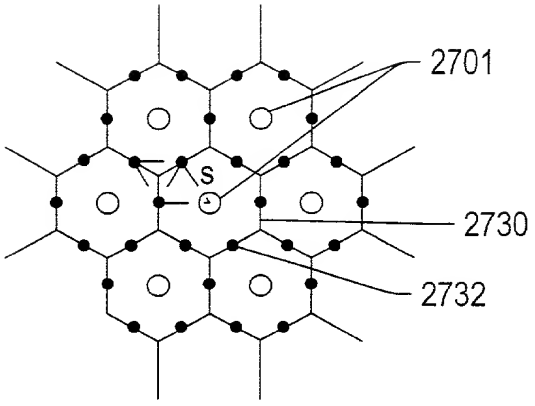

FIG. 49

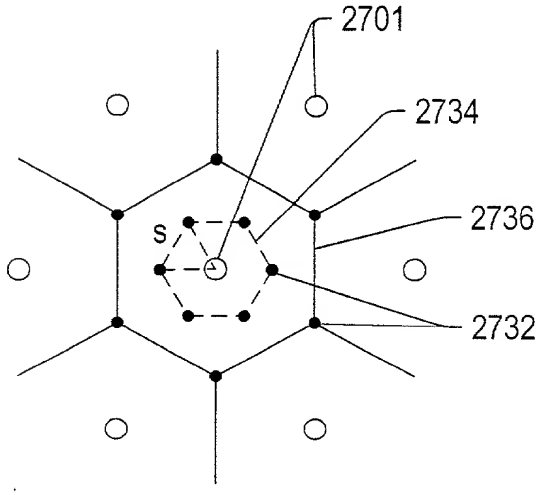

FIG. 50

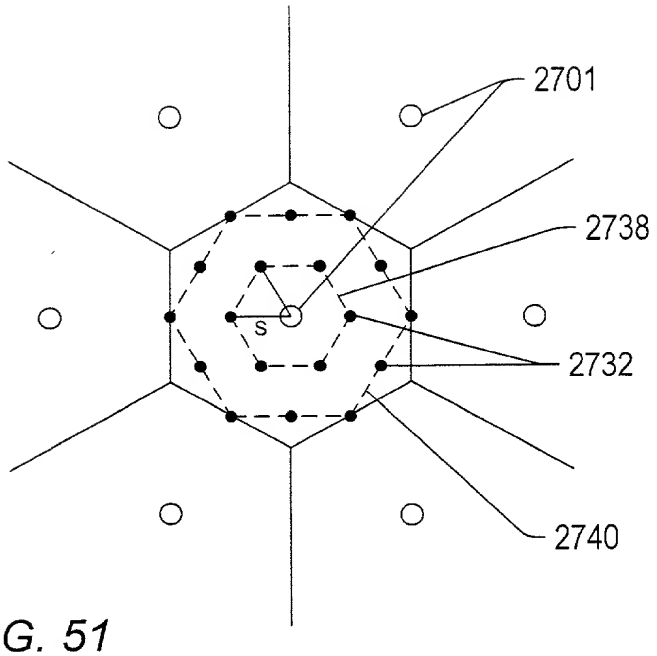

FIG. 51

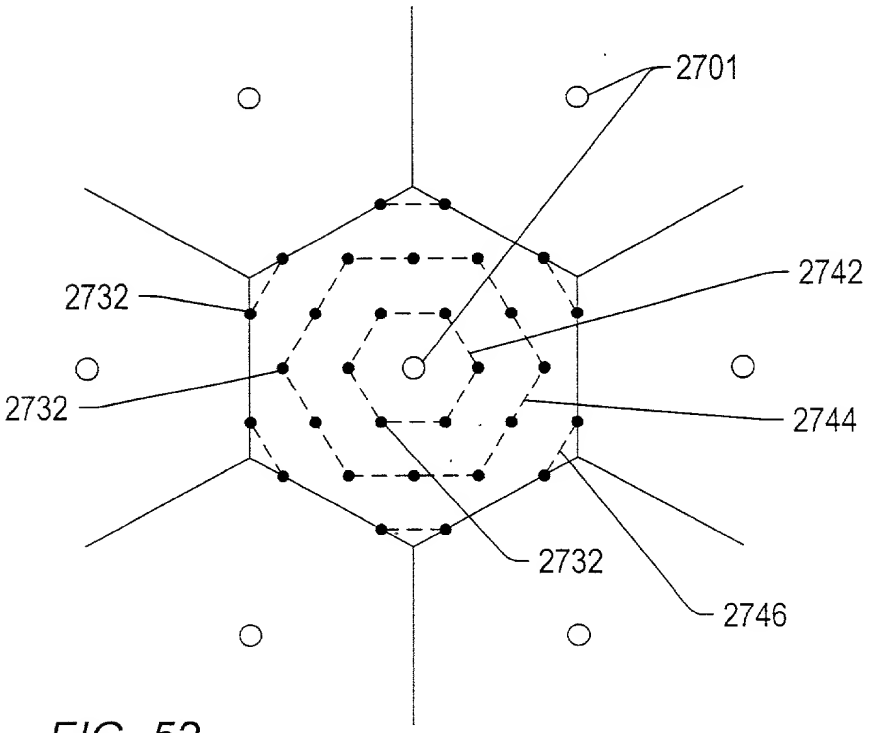

FIG. 52

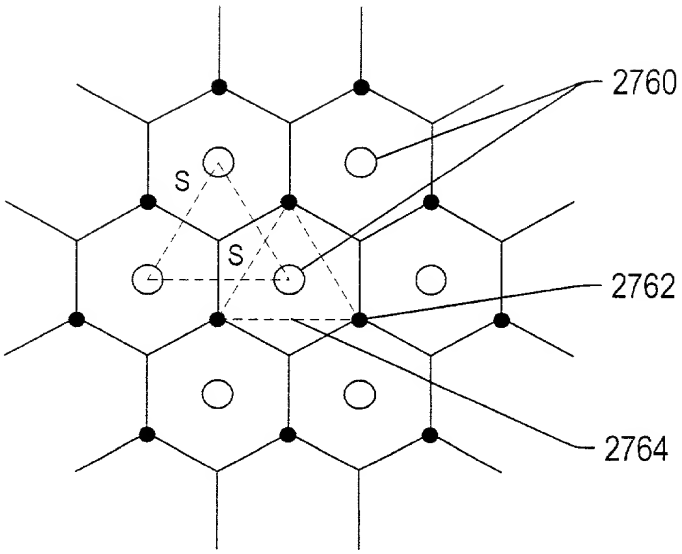

FIG. 53

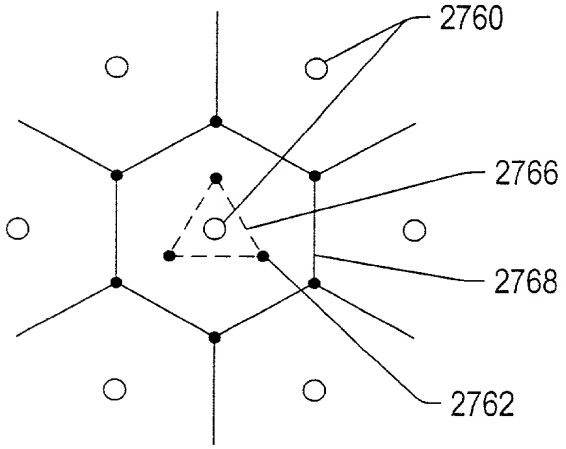

FIG. 54

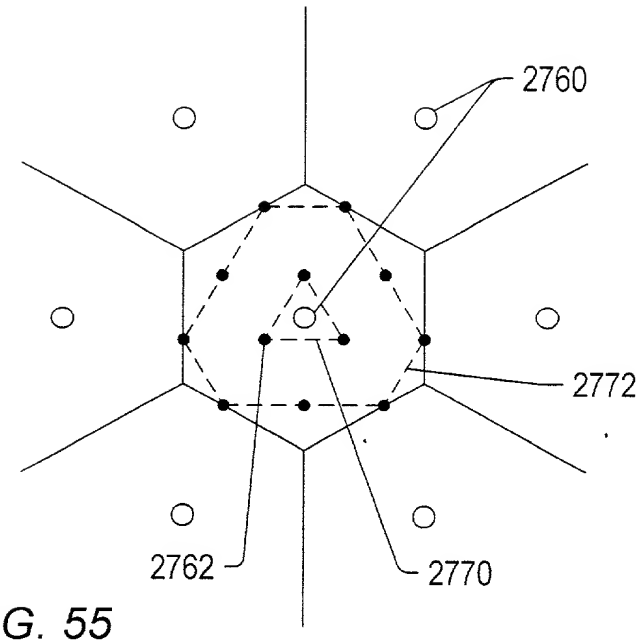

FIG. 55

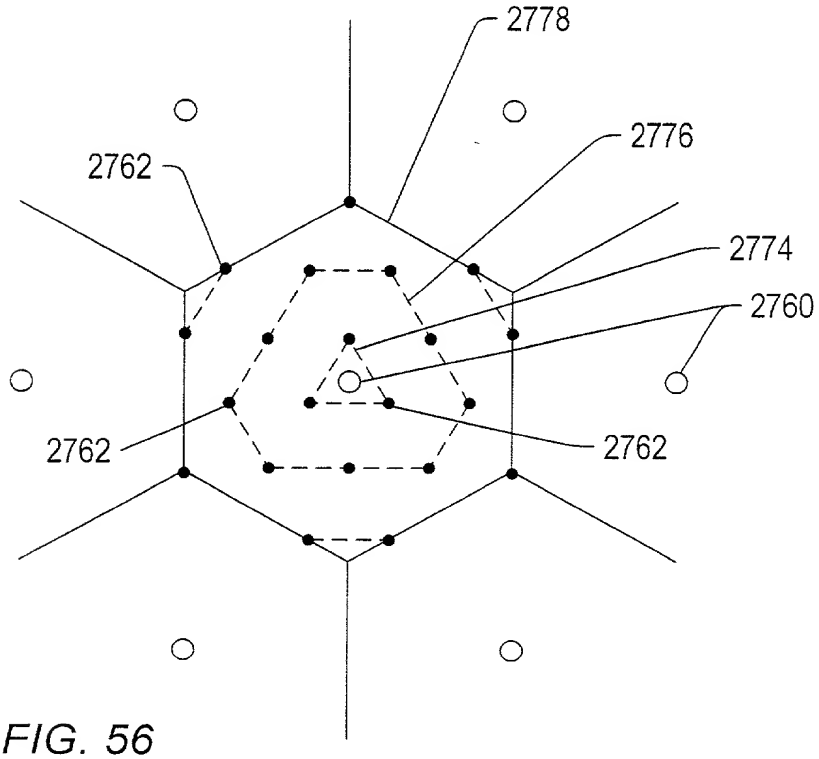

FIG. 56

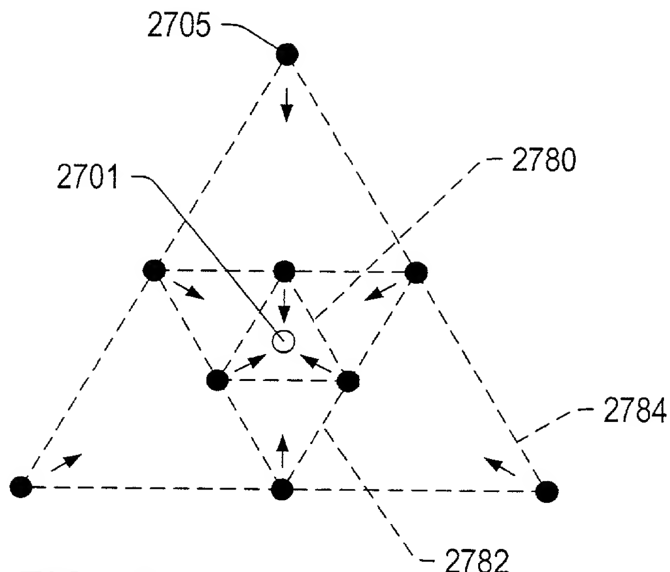

FIG. 57

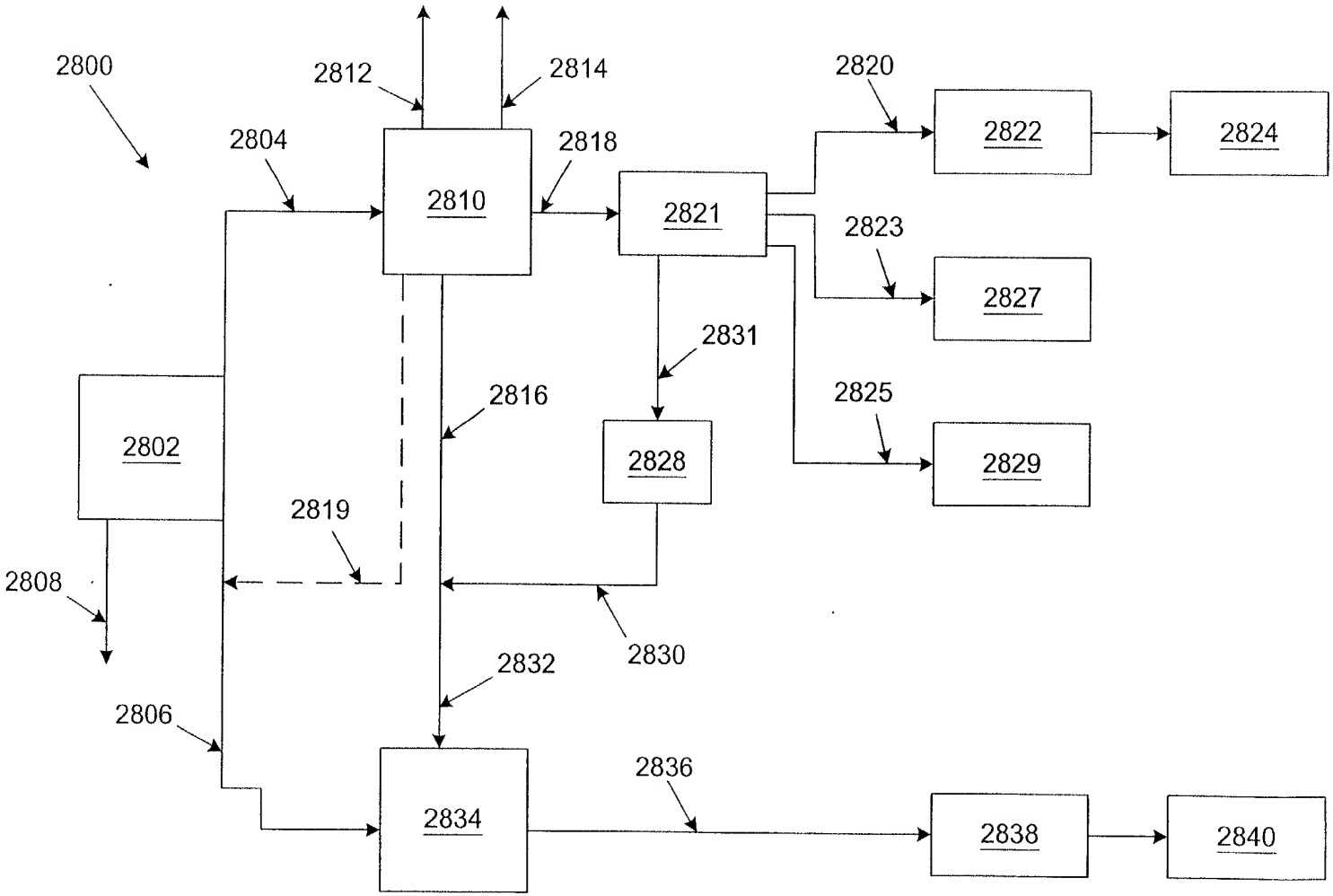
2800
2812
2814
2820
2822
2824
2804
2818
2810
2821
2823
2827
2831
2816
2825
2802
2828
2829
2819
2808
2830
2832
2806
2836
2834
2838
2840

Fig. 58

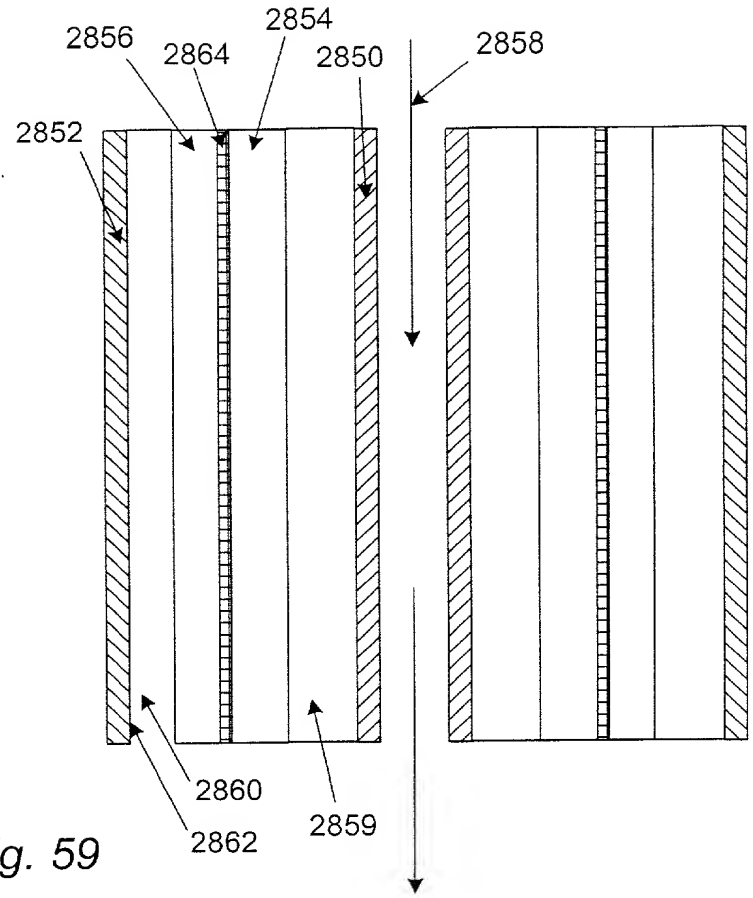
2856
2864
2854
2850
2858
2852
2860
2862
2859

Fig. 59

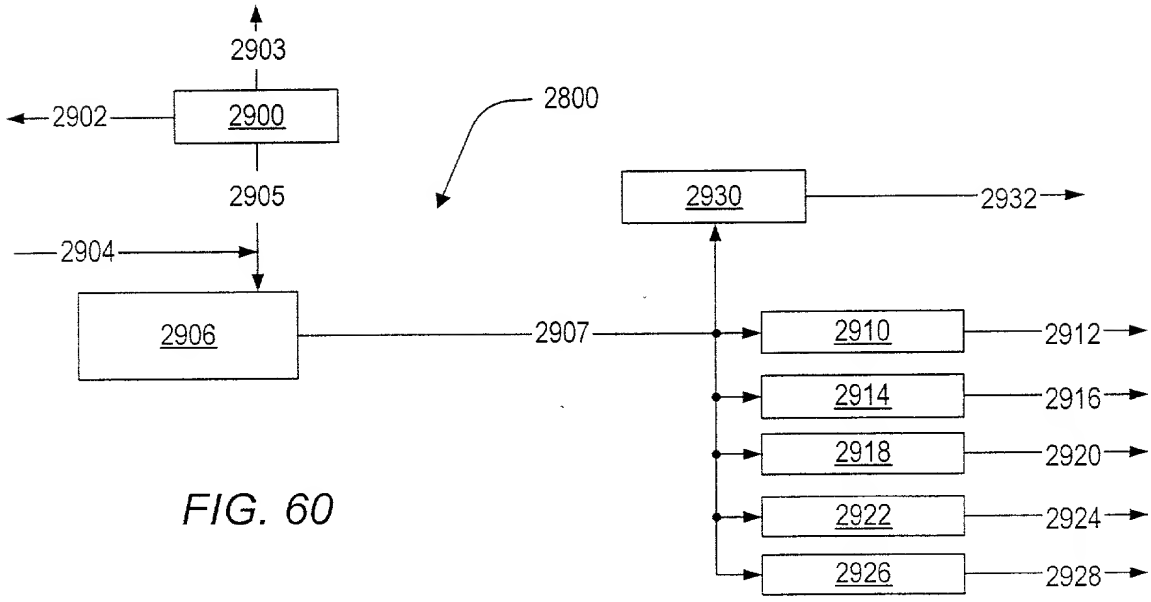
2903
2902
2900
2800
2905
2904
2930
2932
2906
2907
2910
2912
2914
2916
2918
2920
2922
2924
2926
2928

FIG. 60

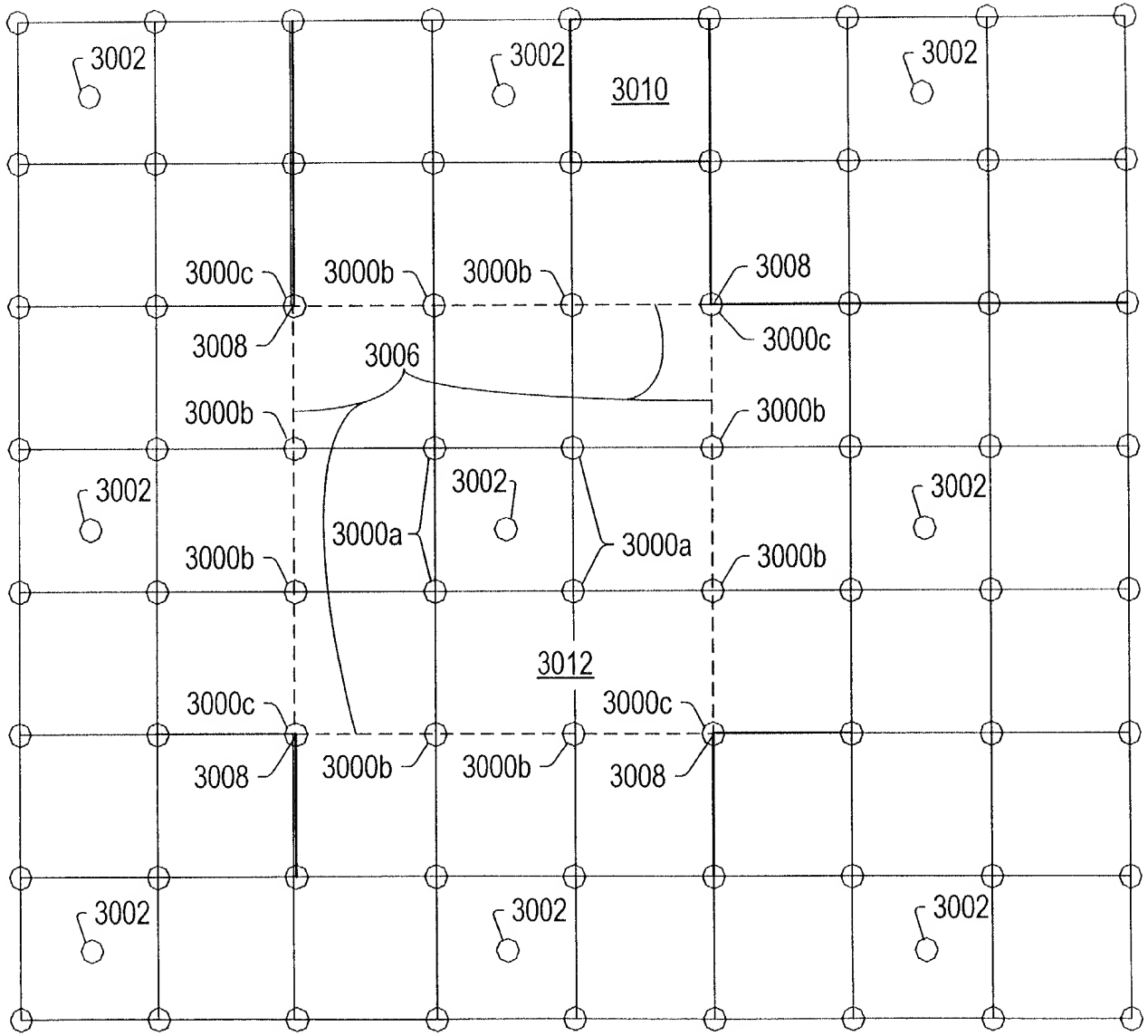
3002
3002
3010
3002
3000c
3000b
3000b
3008
3008
3000c
3006
3000b
3000b
3002
3002
3002
3000a
3000a
3000b
3000b
3012
3000c
3000c
3008
3000b
3000b
3008
3002
3002
3002

FIG. 61

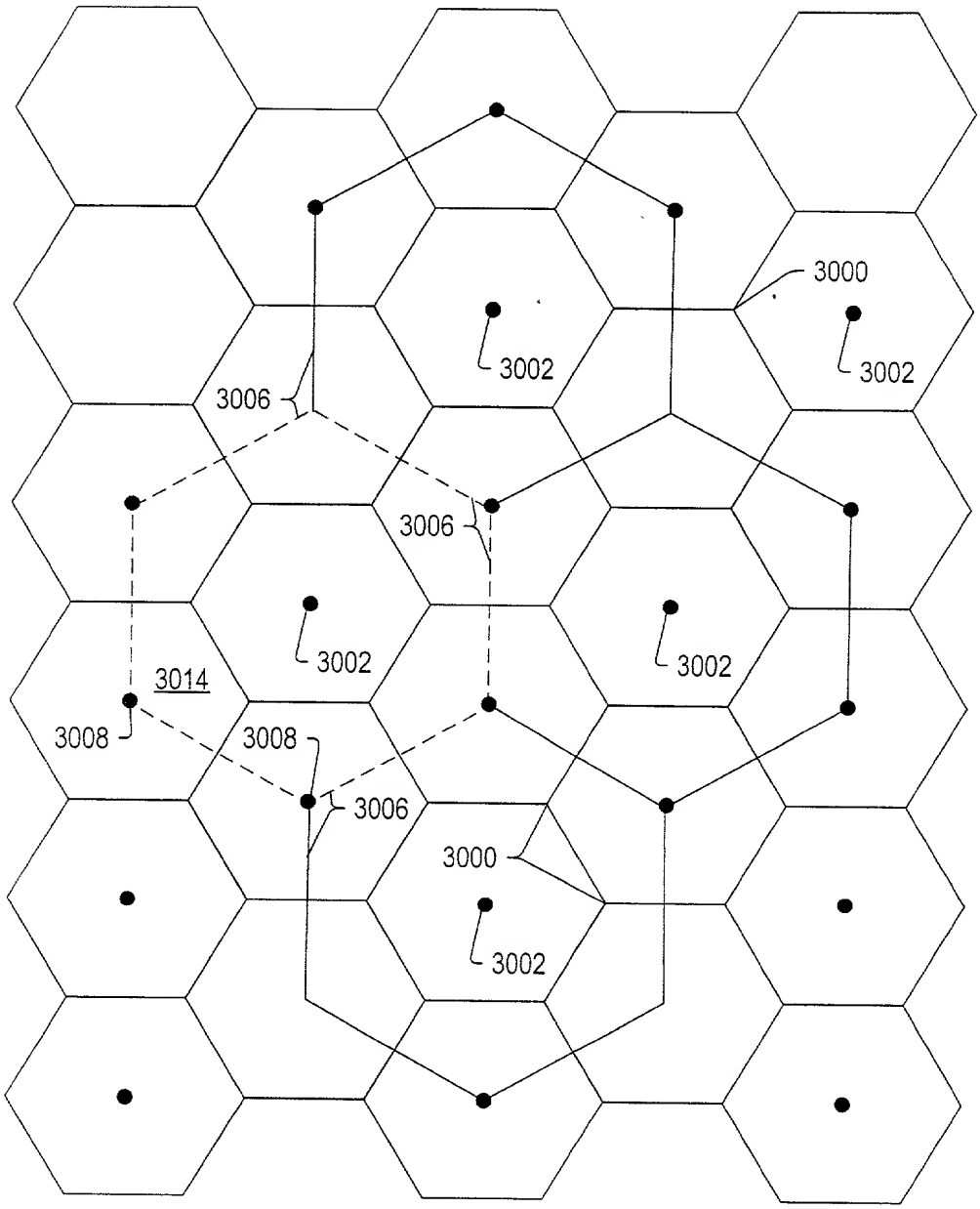
3000
3002
3002
3006
3006
3002
3002
3014
3008
3008
3006
3000
3002

FIG. 62

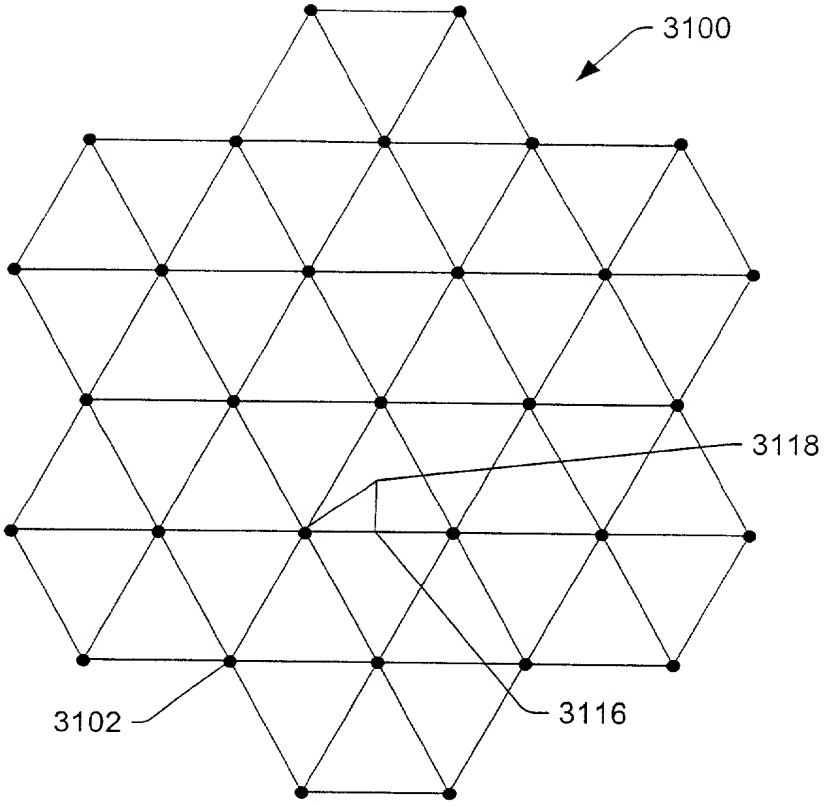

FIG. 63

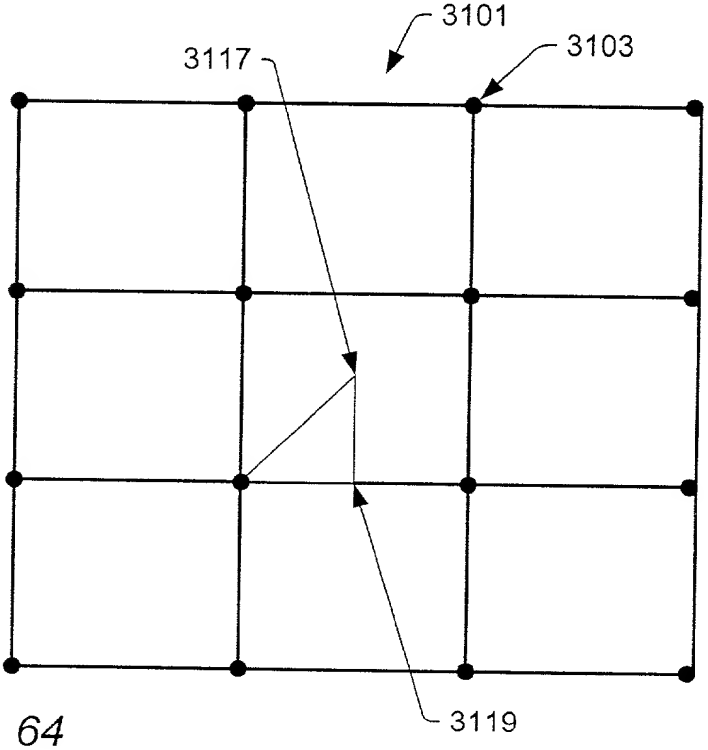

FIG. 64

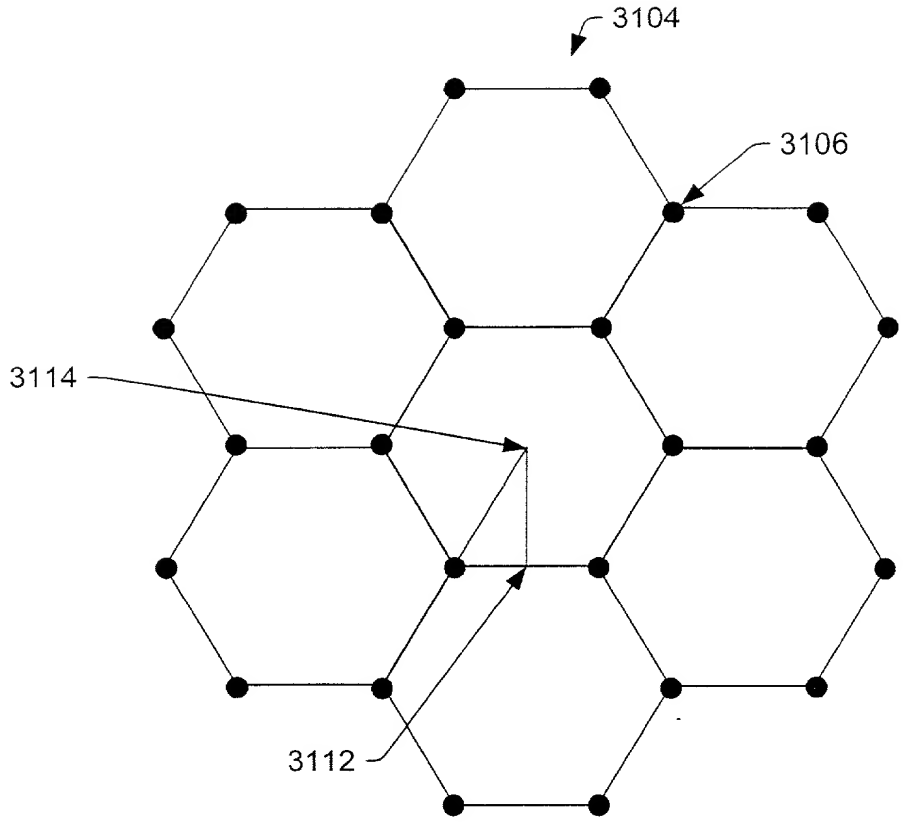

FIG. 65

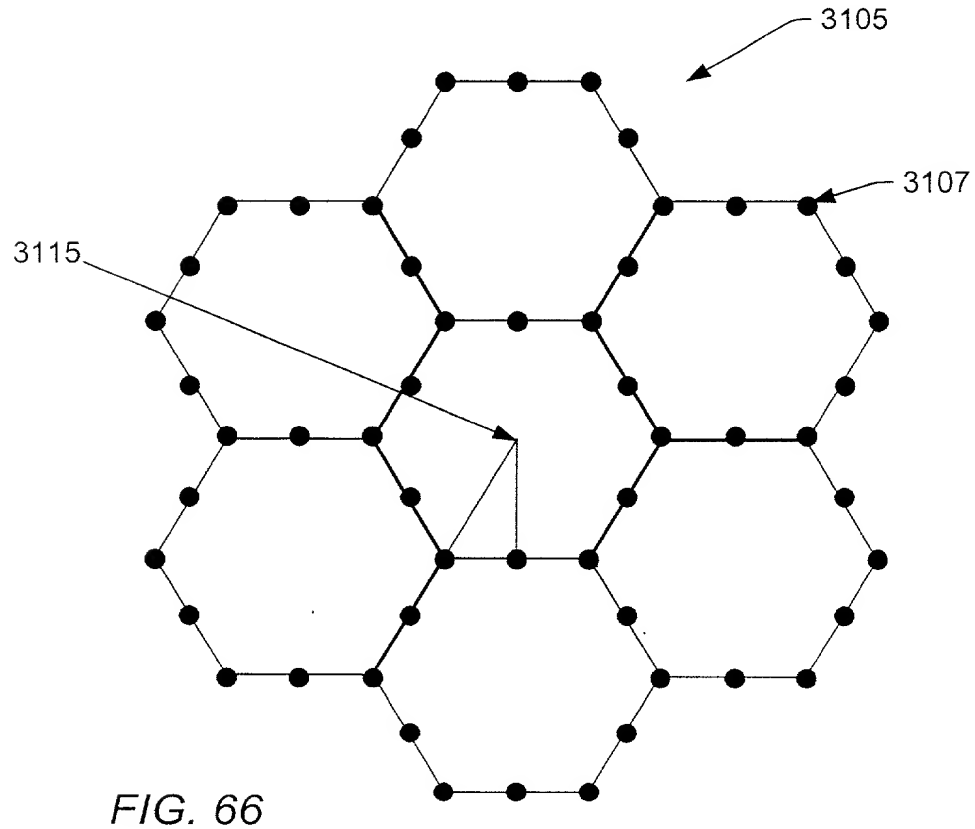

FIG. 66

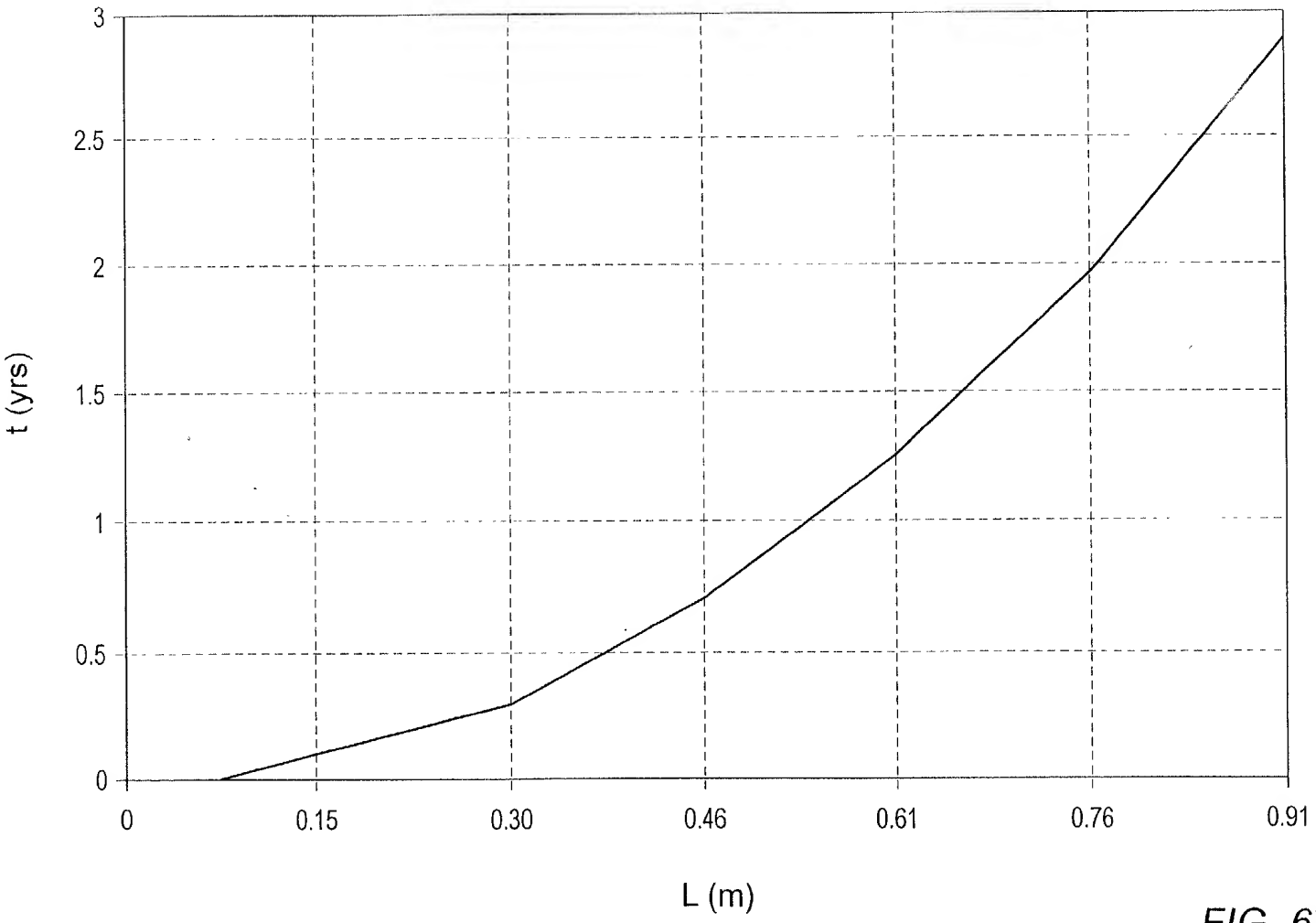

FIG. 67

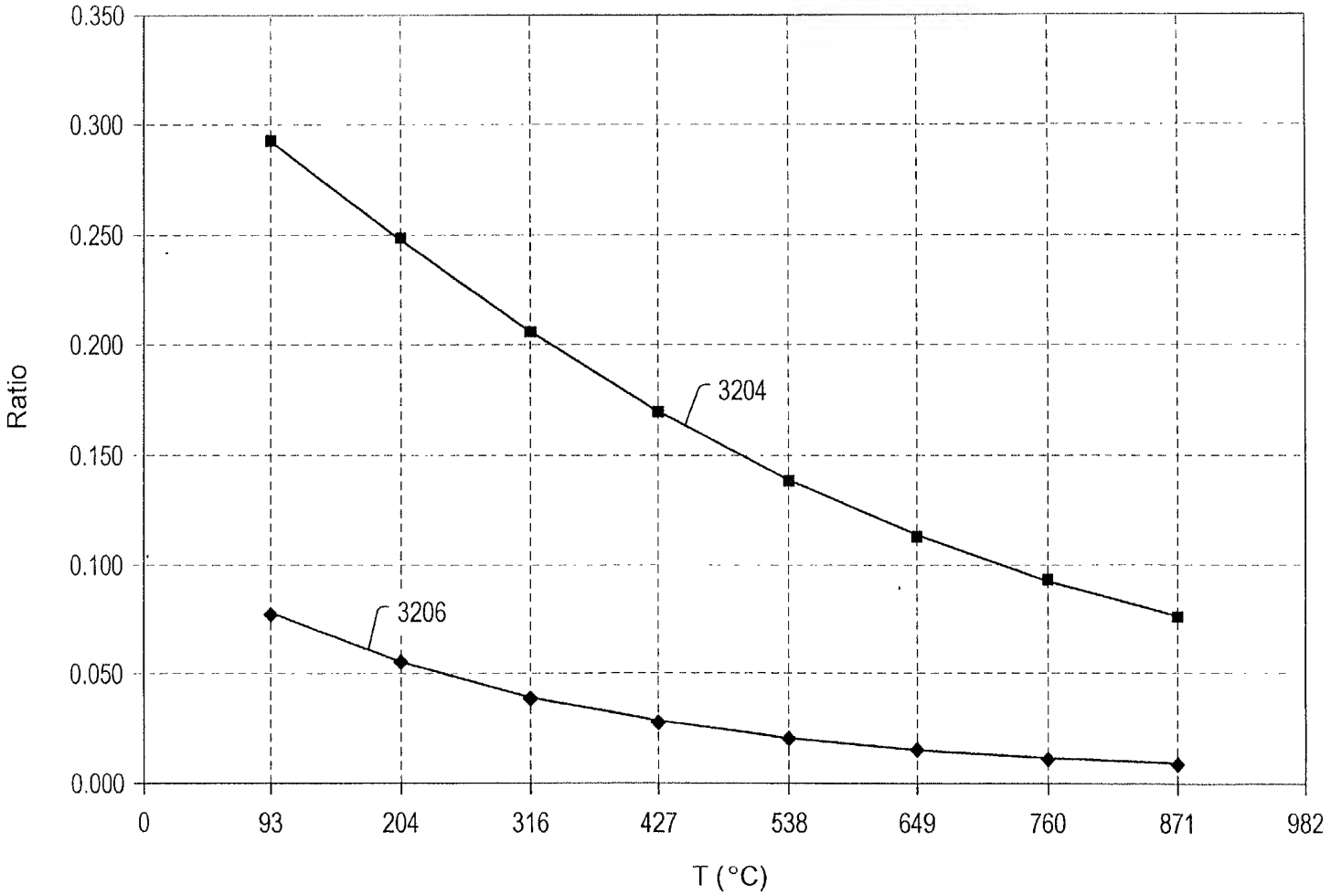
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
Ratio
3204
3206
0
93
204
316
427
538
649
760
871
982
T (°C)

FIG. 68

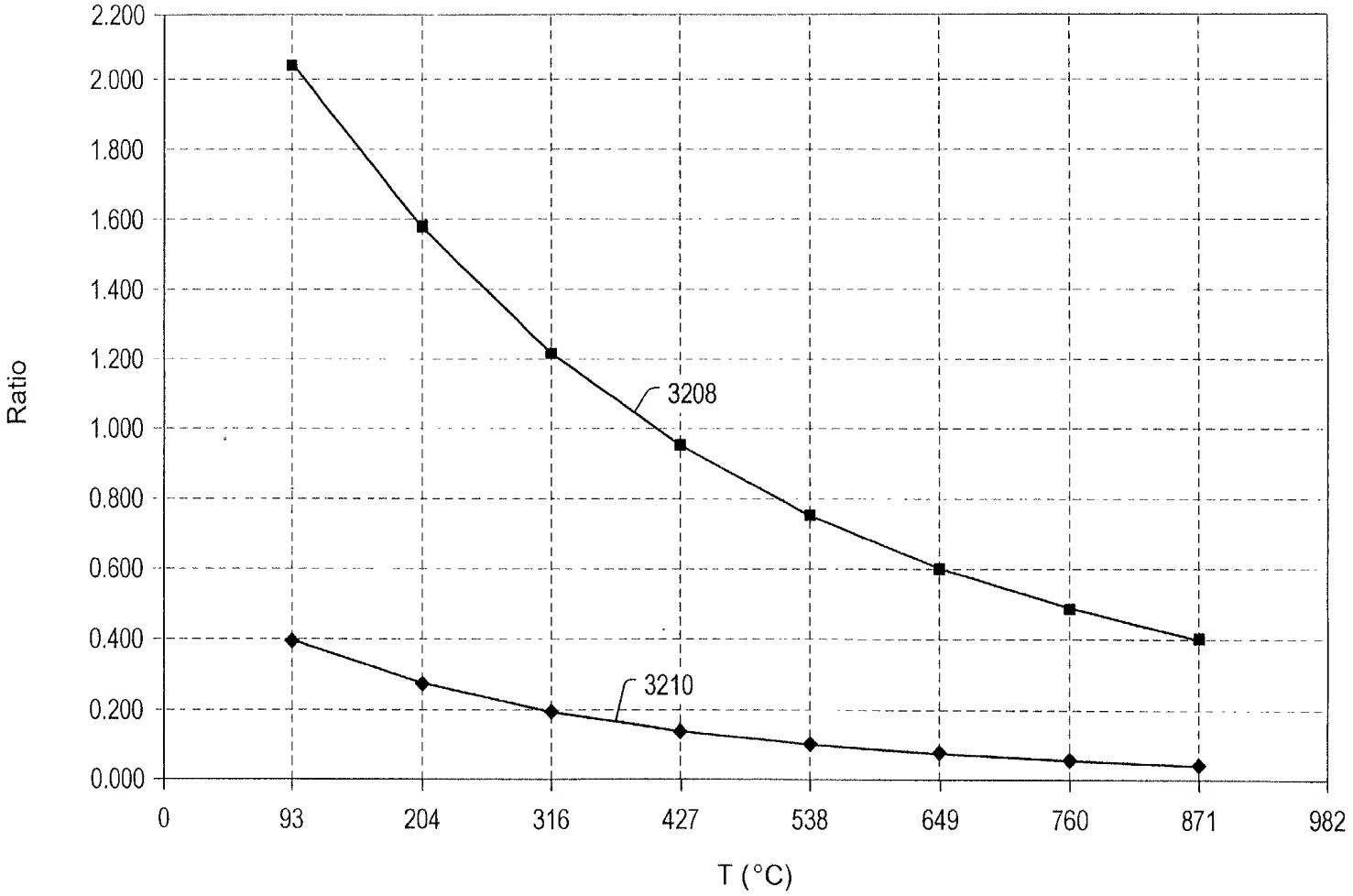

FIG. 69

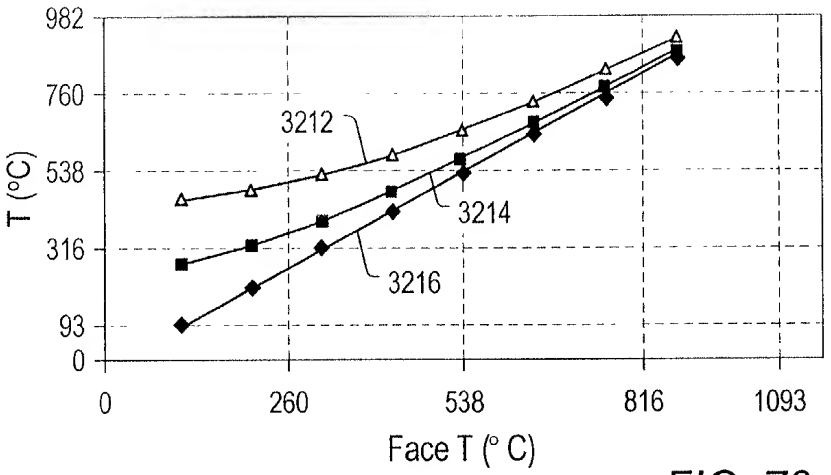

FIG. 70

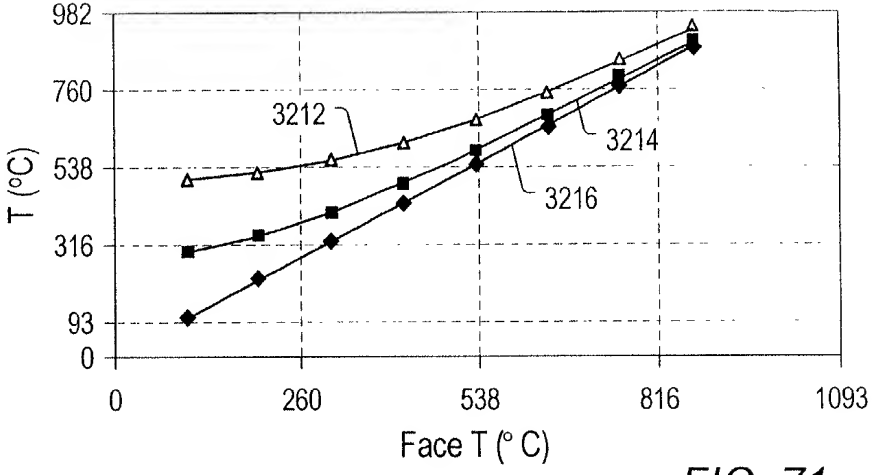

FIG. 71

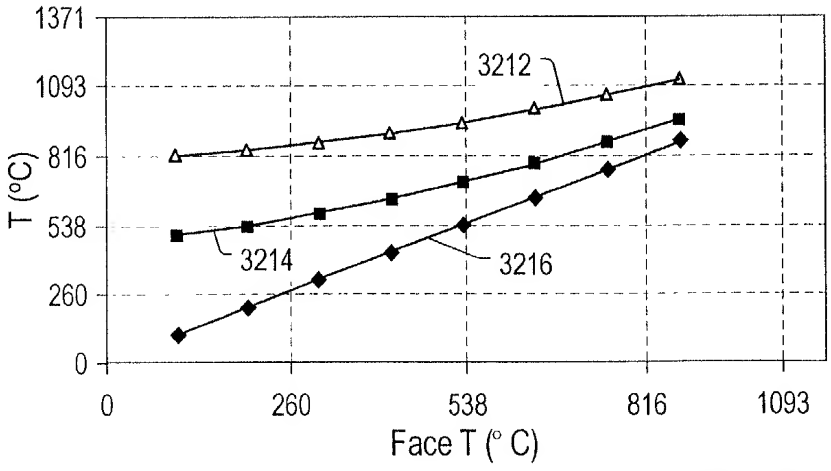

FIG. 72

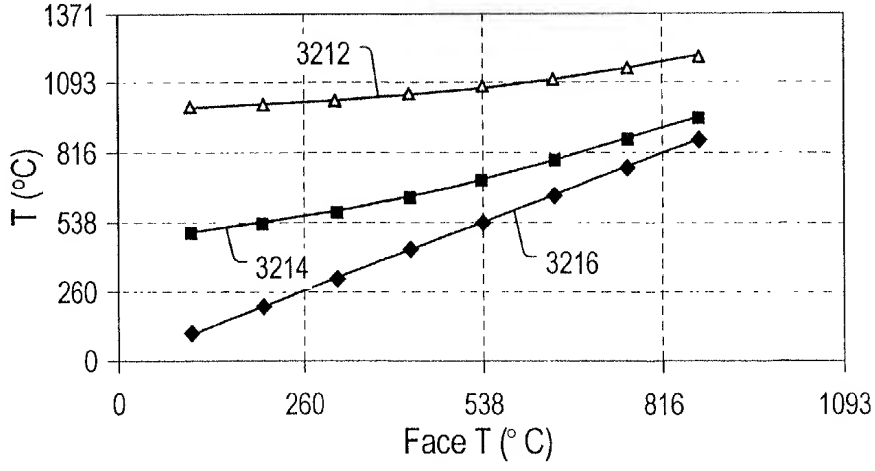

FIG. 73

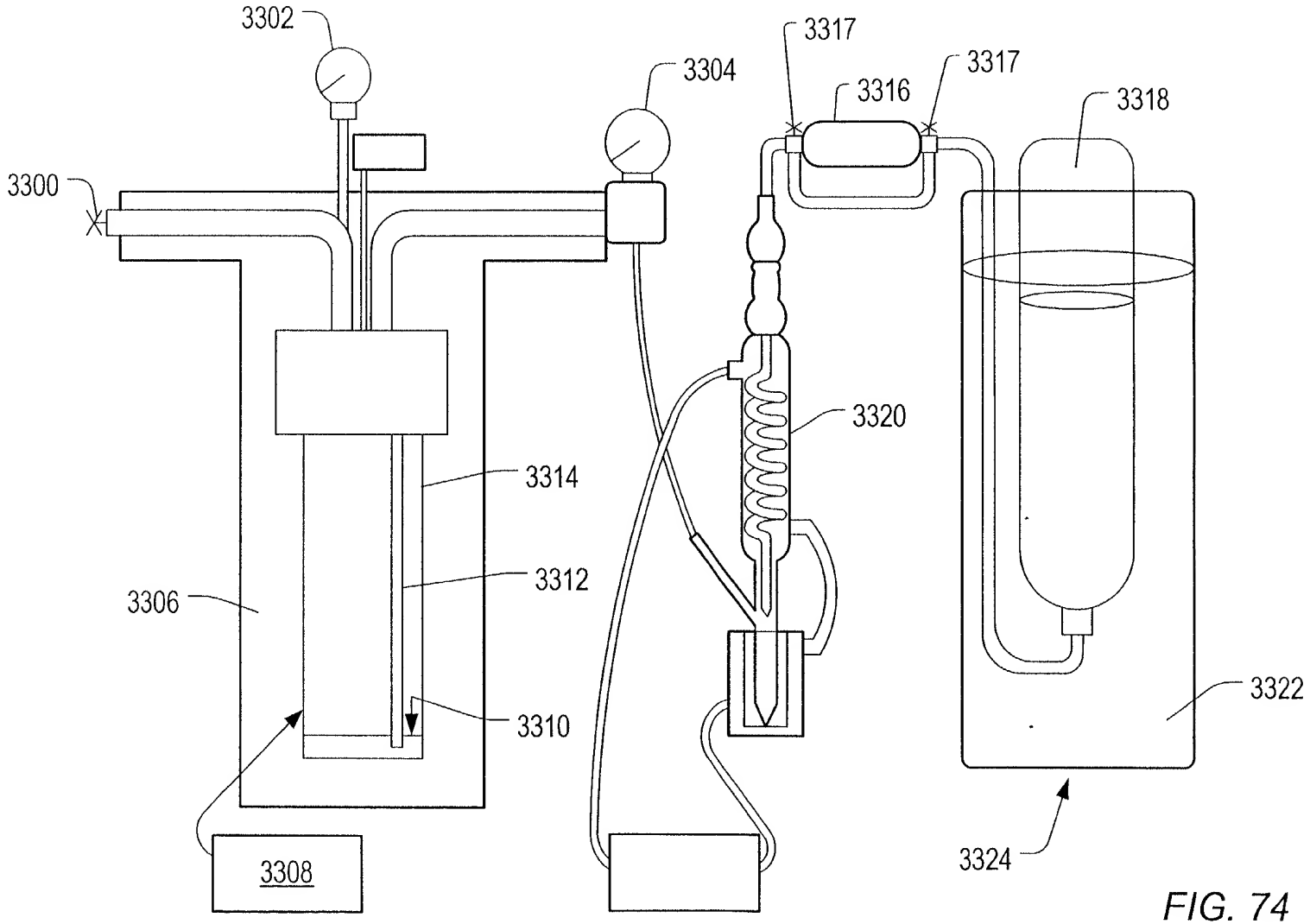
3302
3304
3317
3316
3317
3318
3300
3320
3314
3312
3306
3310
3322
3308
3324

FIG. 74

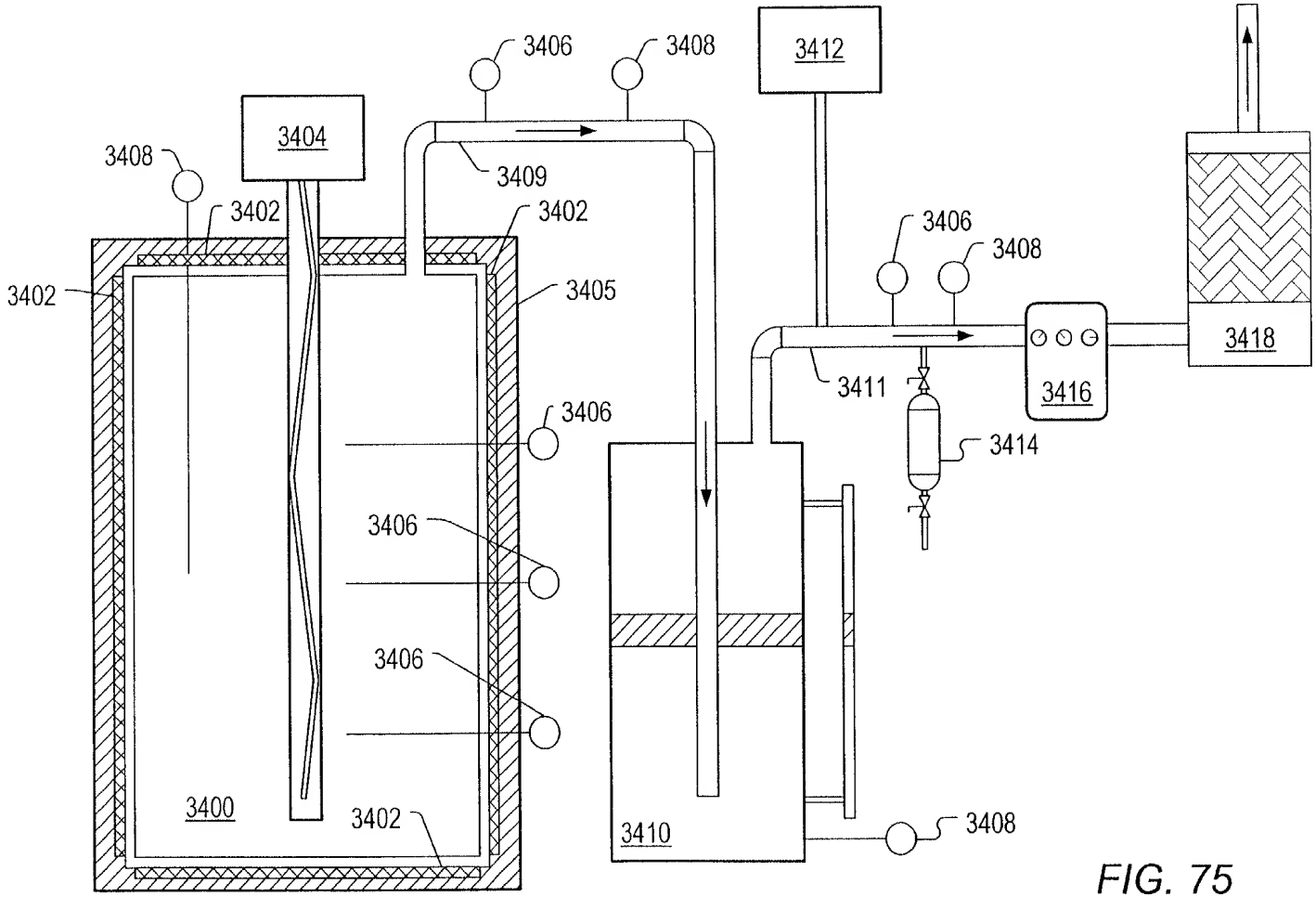
3406
3408
3412
3404
3408
3409
3402
3402
3406
3408
3402
3405
3418
3411
3416
3406
3414
3406
3406
3400
3402
3410
3408

FIG. 75

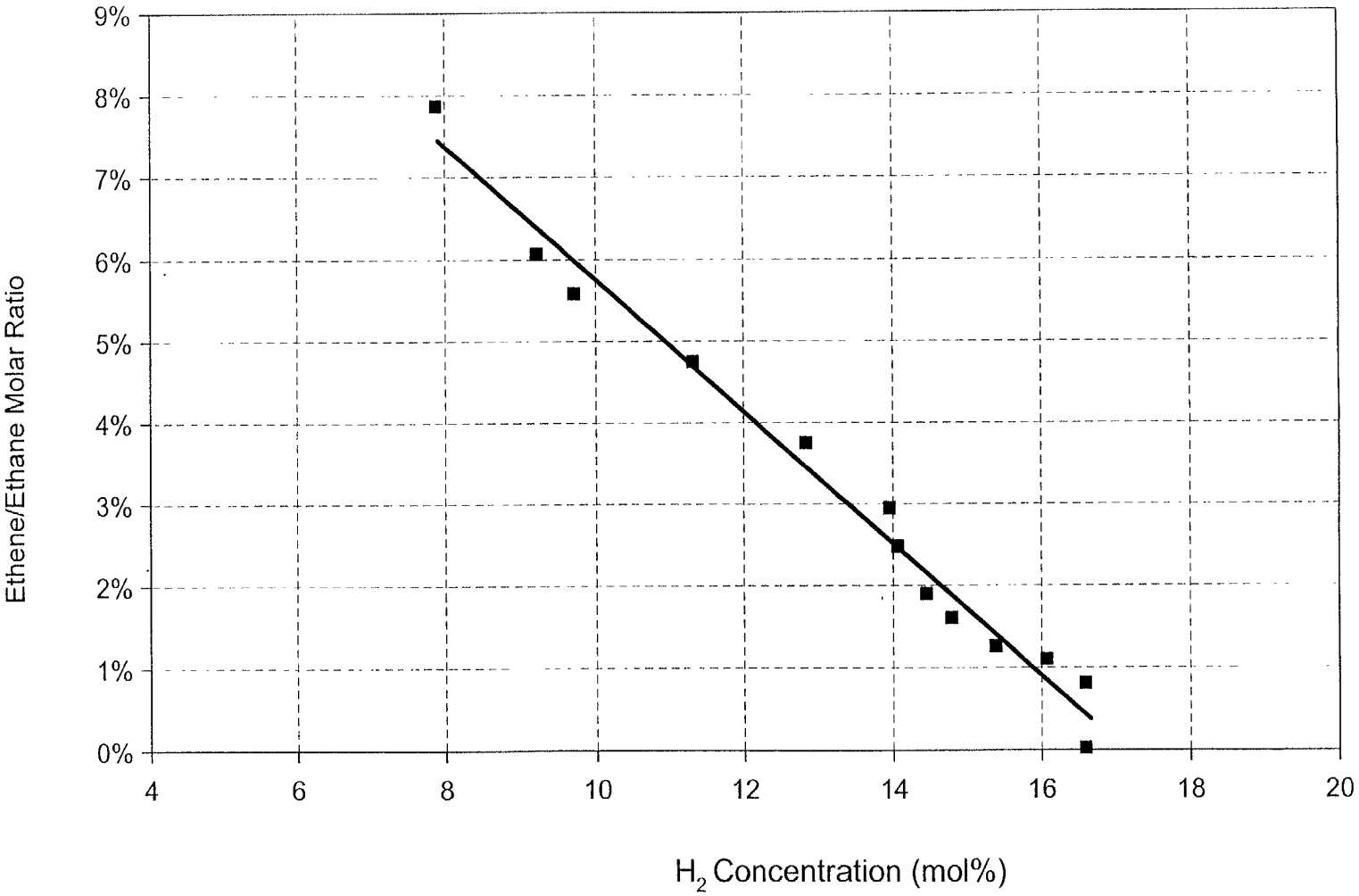
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
4
6
8
10
12
14
16
18
20
Ethene/Ethane Molar Ratio
H2 Concentration (mol%)

FIG. 76

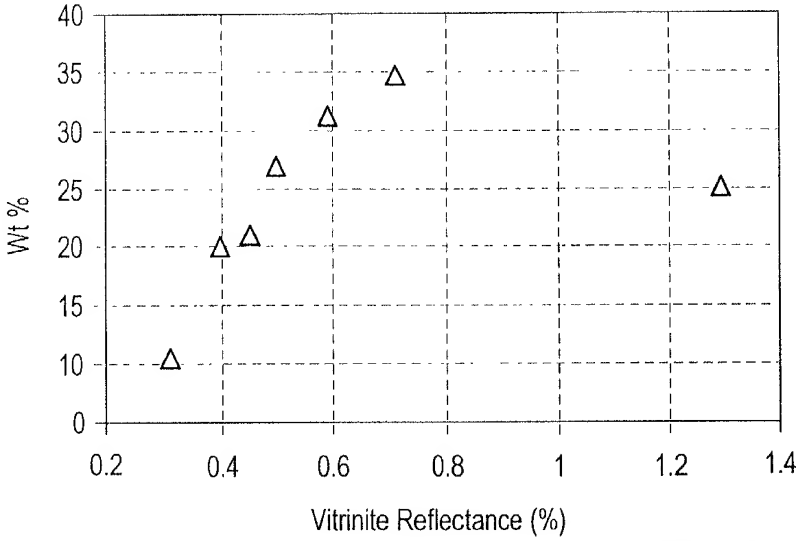

FIG. 77

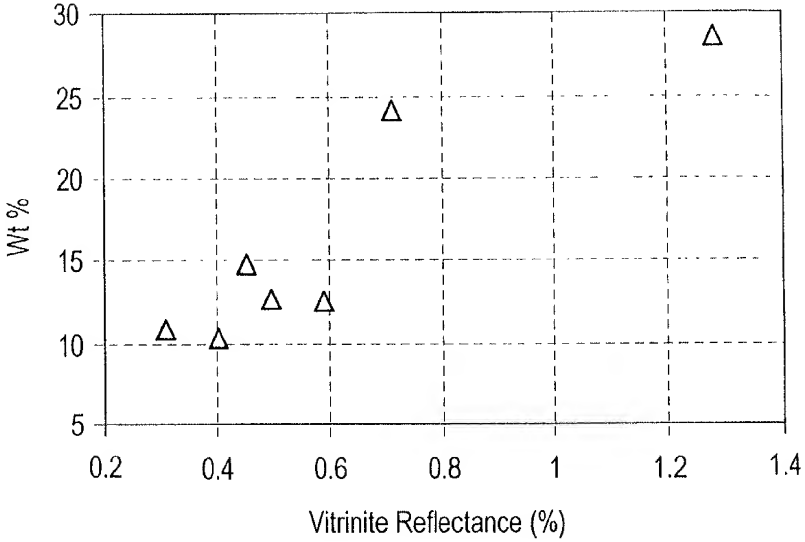

FIG. 78

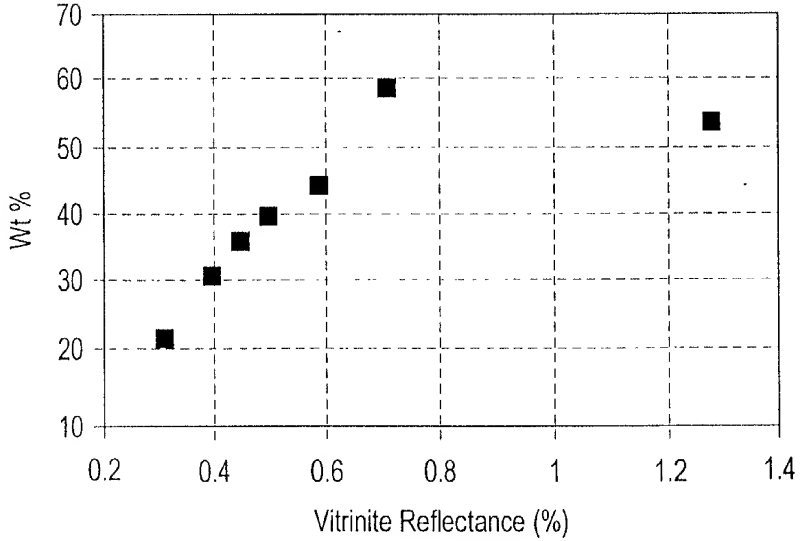

FIG. 79

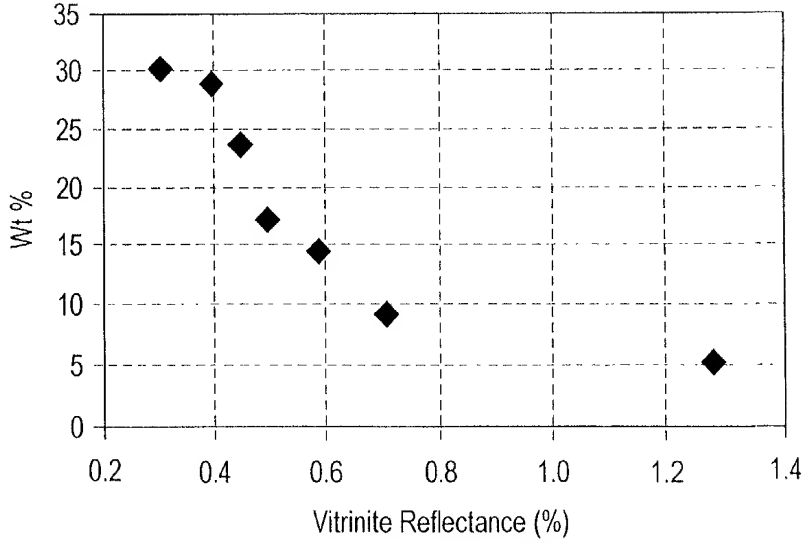

FIG. 80

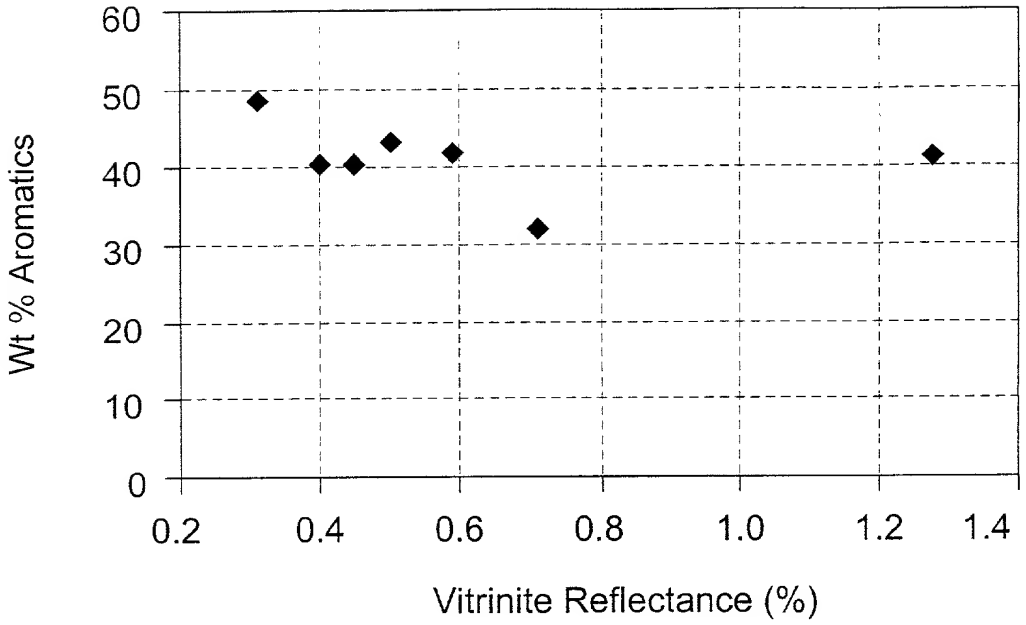
60
50
40
30
20
10
0
Wt % Aromatics
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Vitrinite Reflectance (%)

FIG. 81

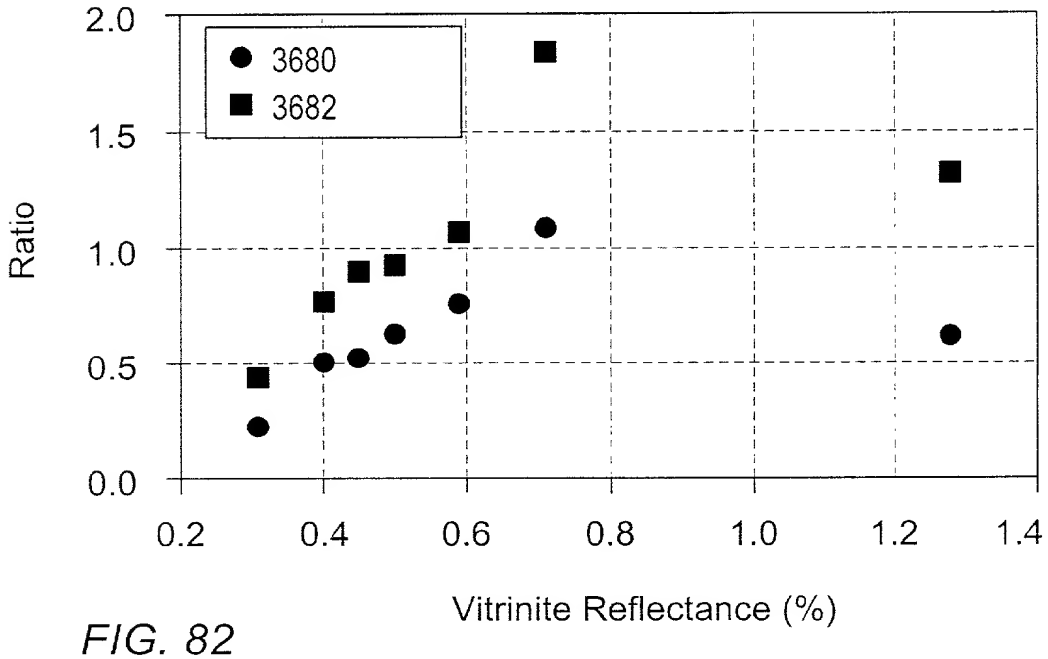
2.0
1.5
1.0
0.5
0.0
Ratio
3680
3682
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Vitrinite Reflectance (%)

FIG. 82

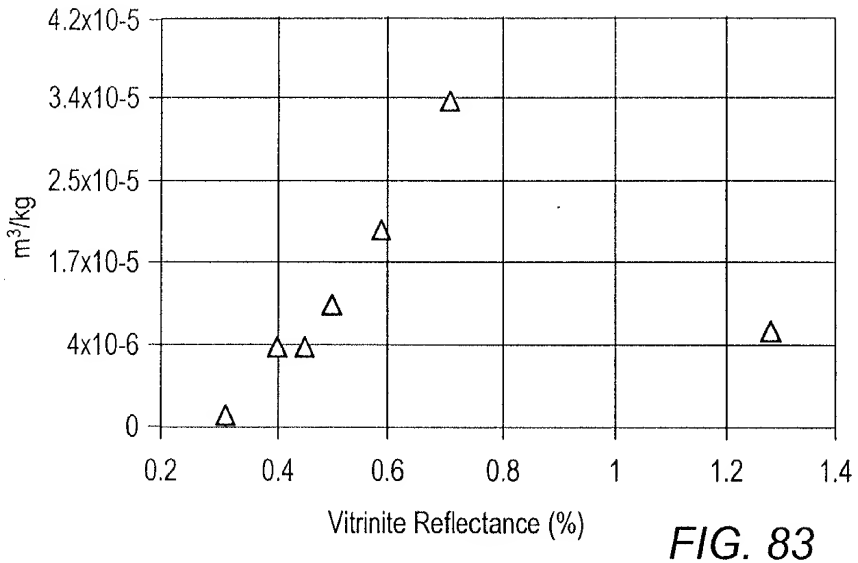

FIG. 83

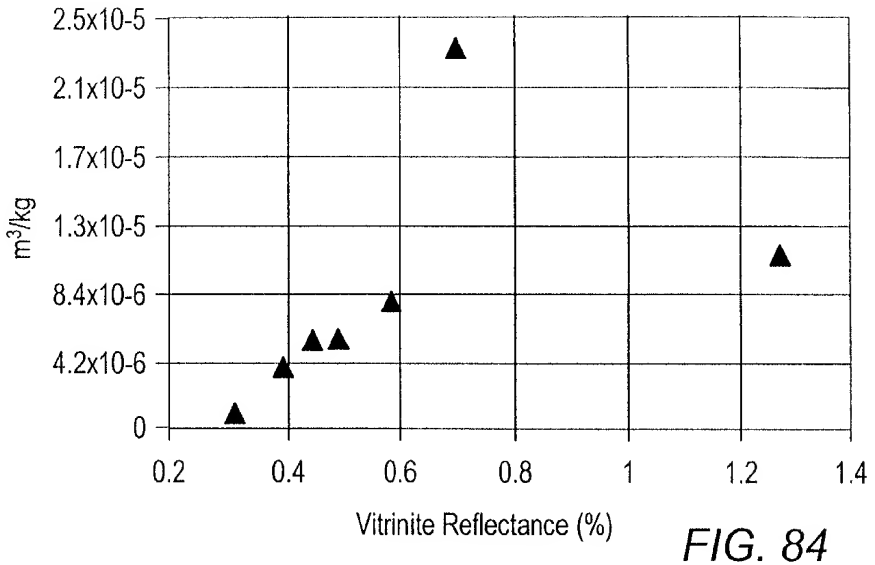

FIG. 84

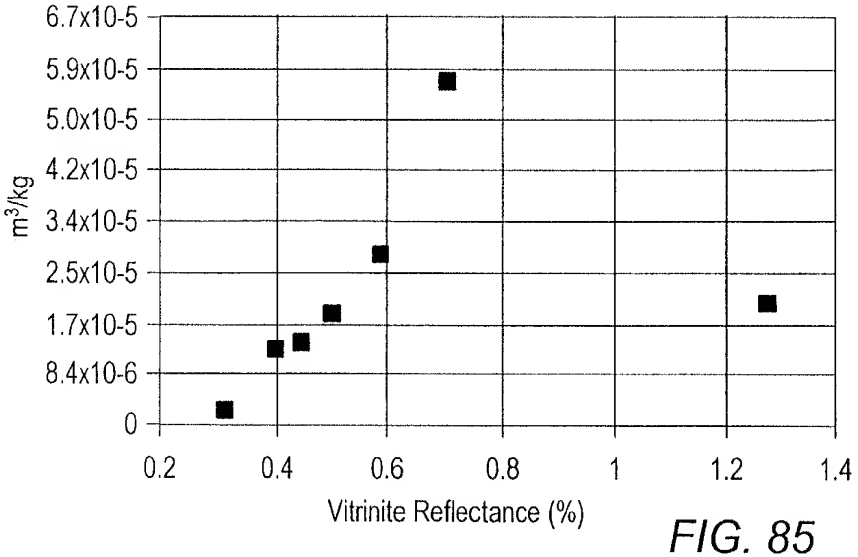

FIG. 85

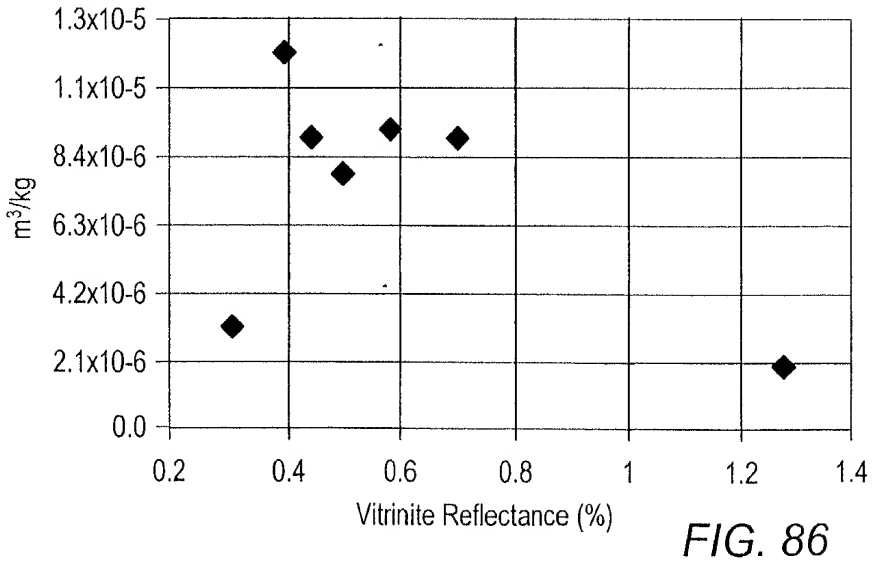

FIG. 86

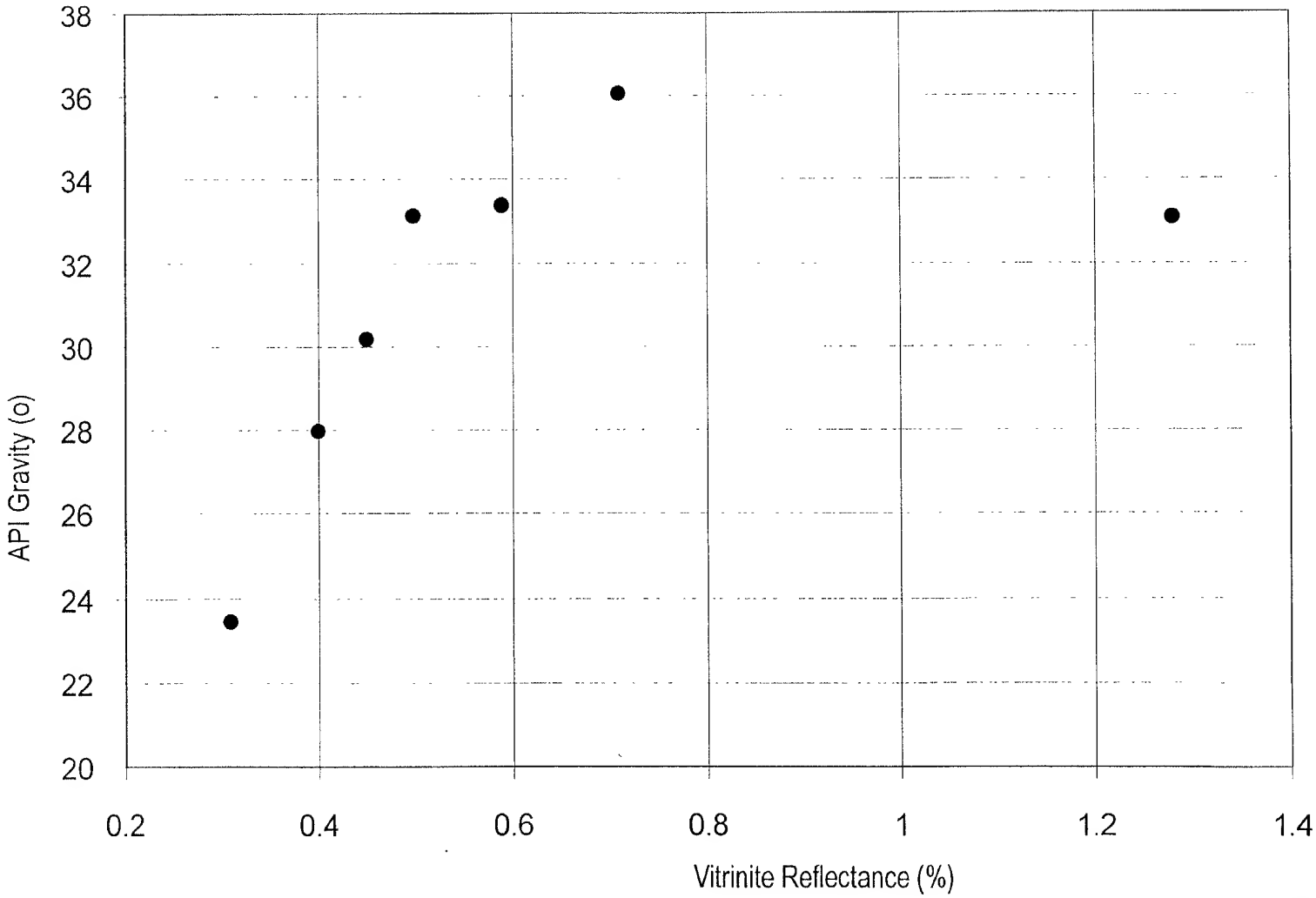
38
36
34
32
30
28
26
24
22
20
API Gravity (o)
0.2
0.4
0.6
0.8
1
1.2
1.4
Vitrinite Reflectance (%)

FIG. 87

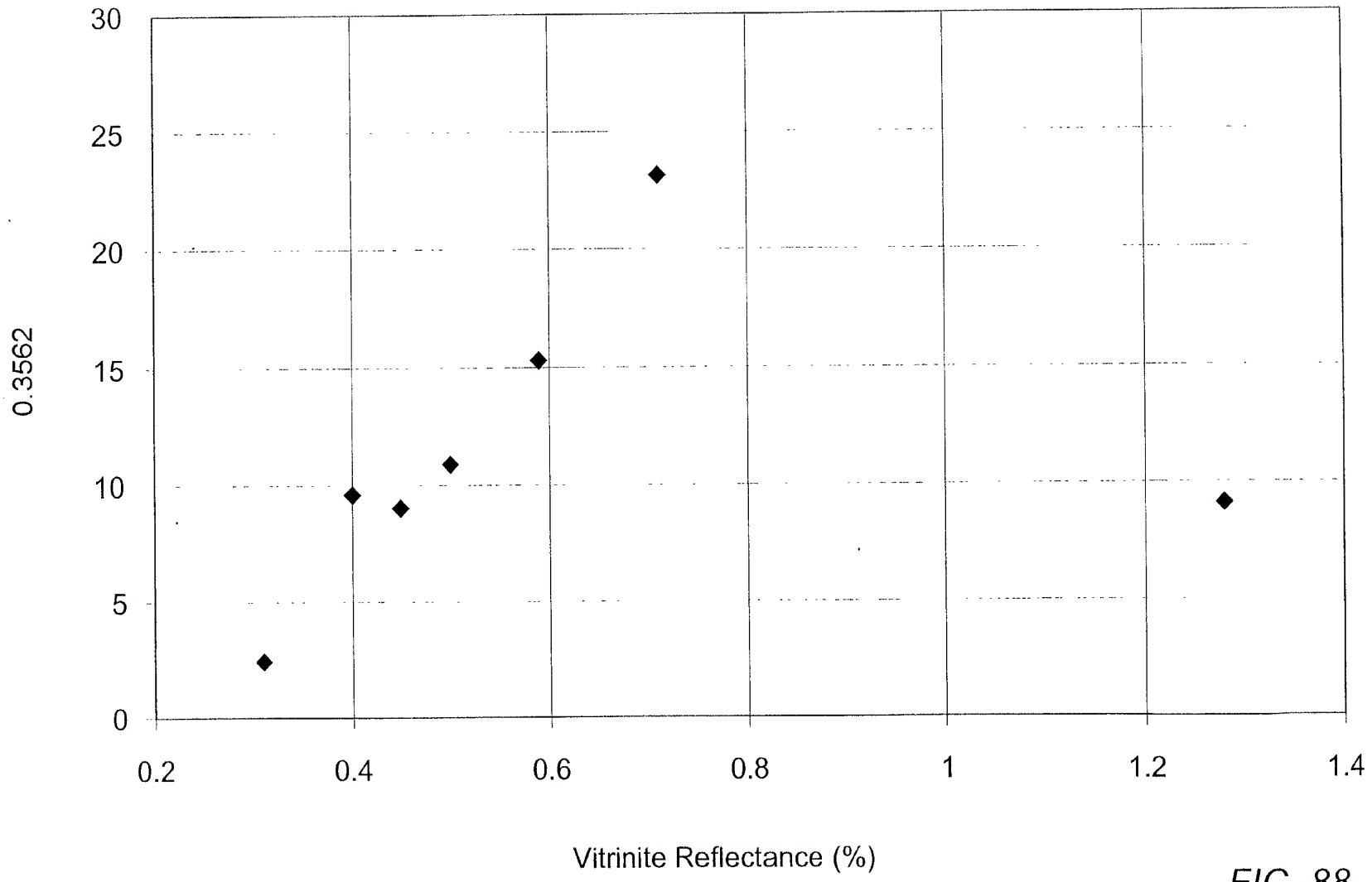
30
25
20
15
10
5
0
0.3562
0.2
0.4
0.6
0.8
1
1.2
1.4
Vitrinite Reflectance (%)

FIG. 88

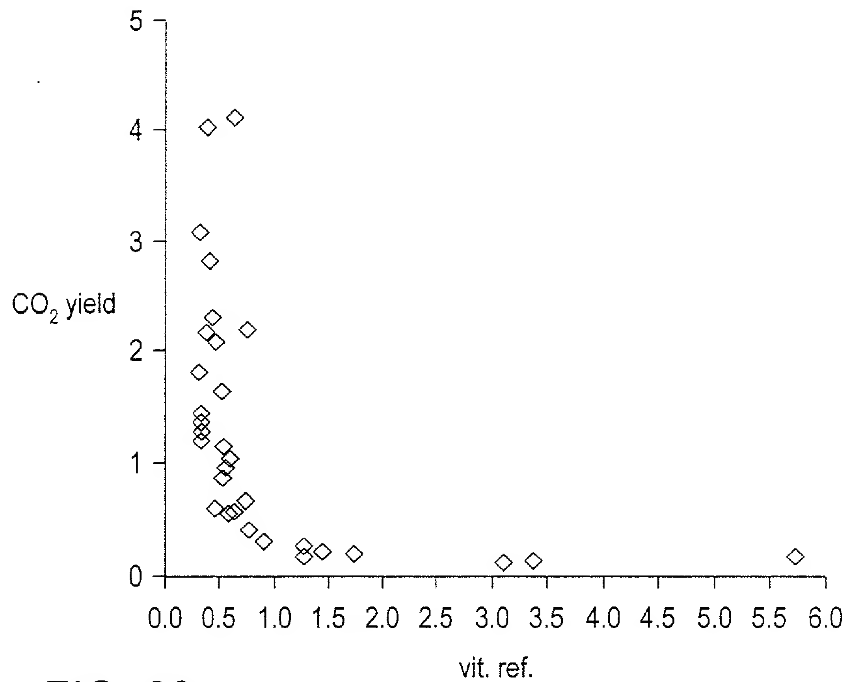
5
4
3
2
1
0
CO2 yield
0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0
vit. ref.

FIG. 89

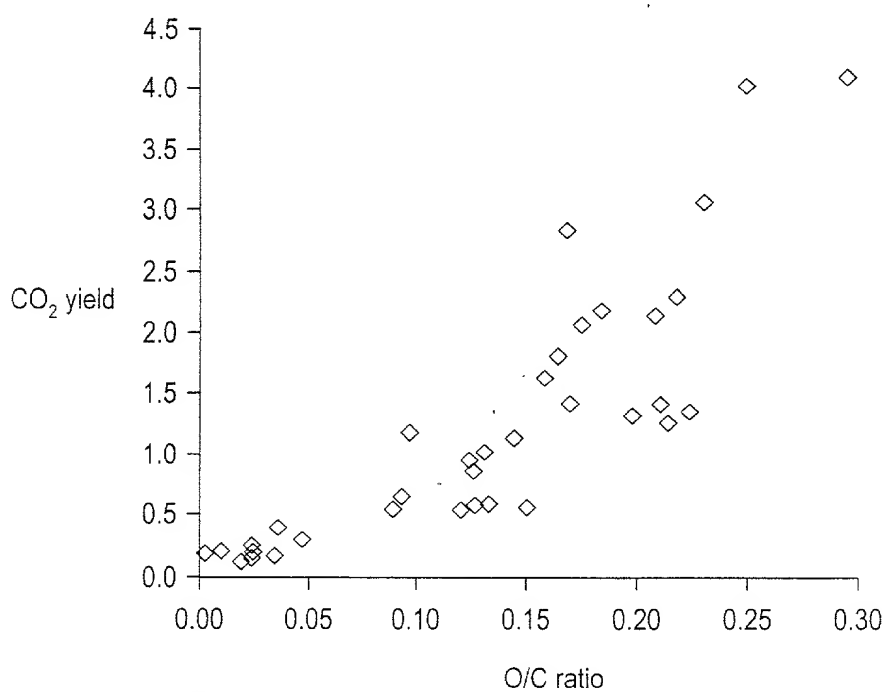
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
CO2 yield
0.00 0.05 0.10 0.15 0.20 0.25 0.30
O/C ratio

FIG. 90

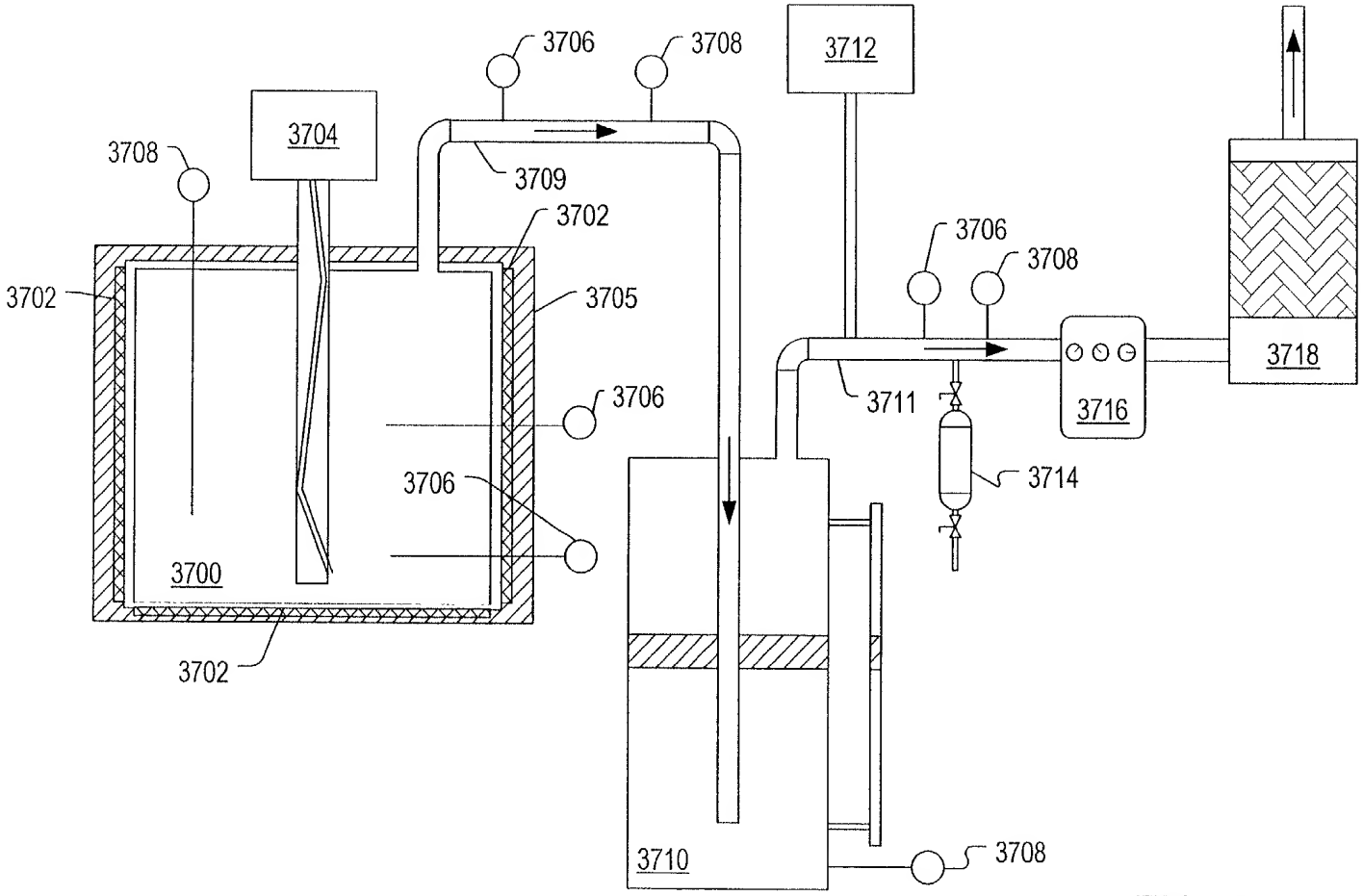

FIG. 91

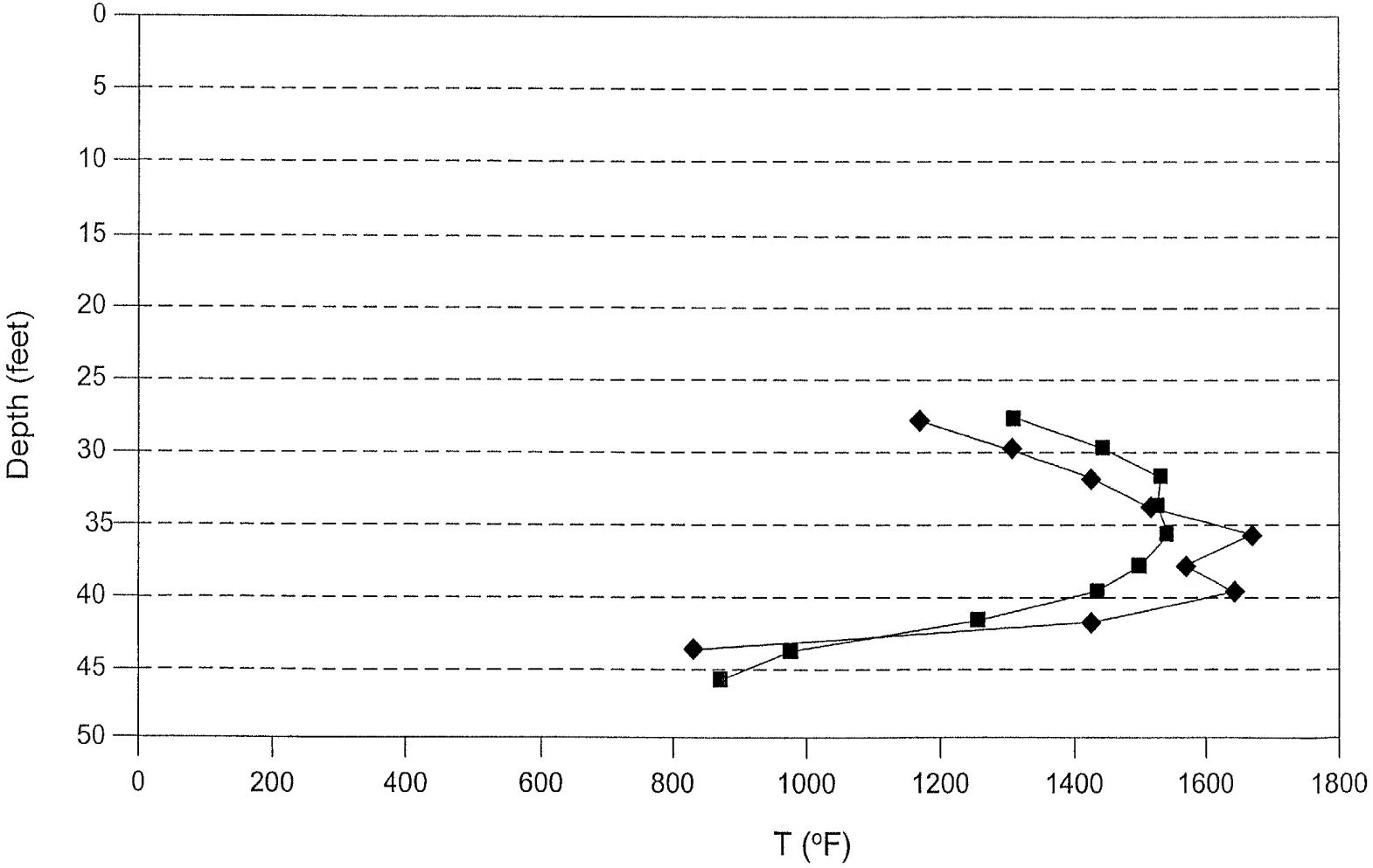
Depth (feet)
0
5
10
15
20
25
30
35
40
45
50
0
200
400
600
800
1000
1200
1400
1600
1800
T (°F)

FIG. 92

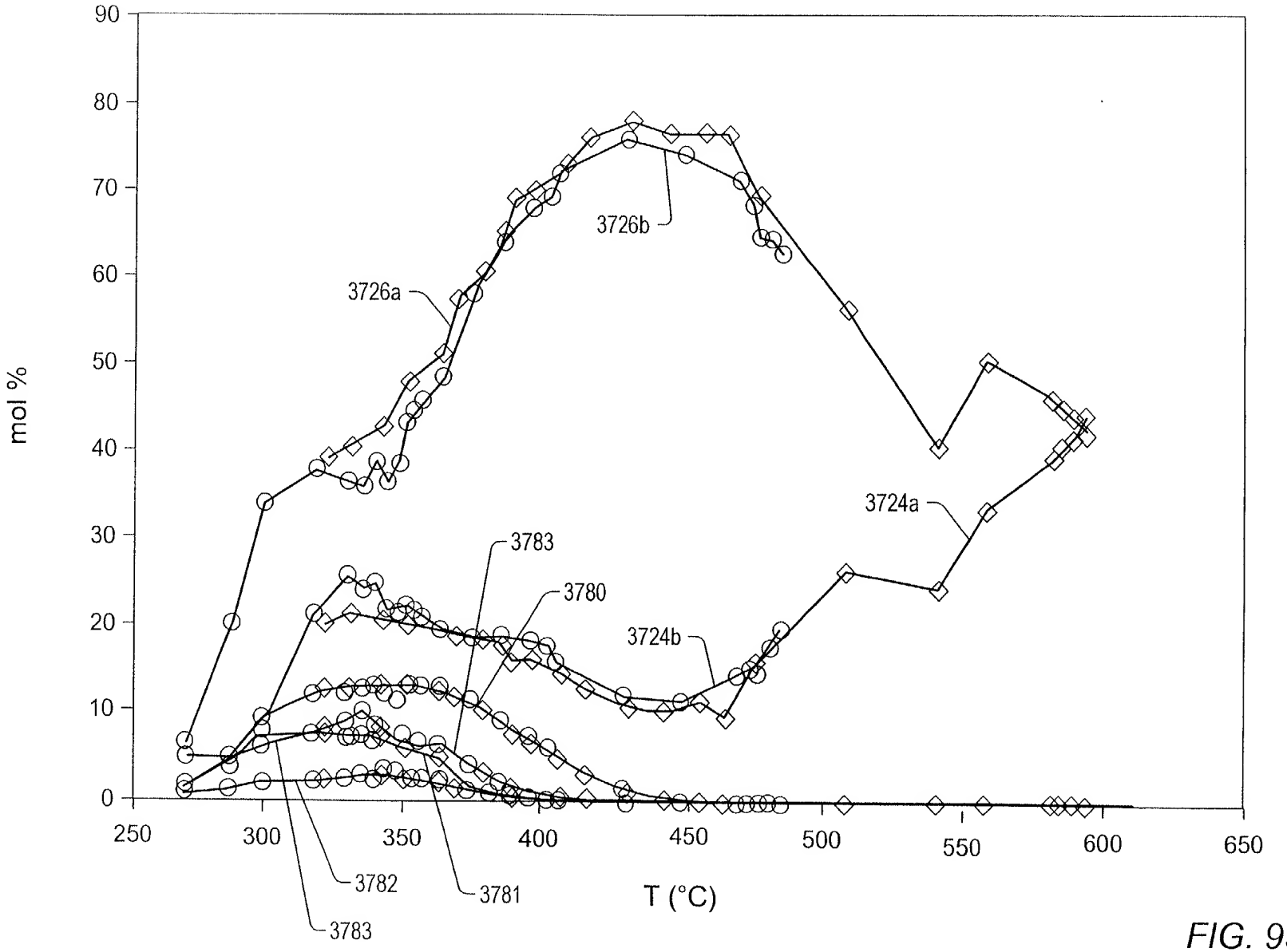
90
80
70
60
50
40
30
20
10
0
mol %
250
300
350
400
450
500
550
600
650
T (°C)
3726a
3726b
3724a
3724b
3783
3780
3782
3781
3783

FIG. 93

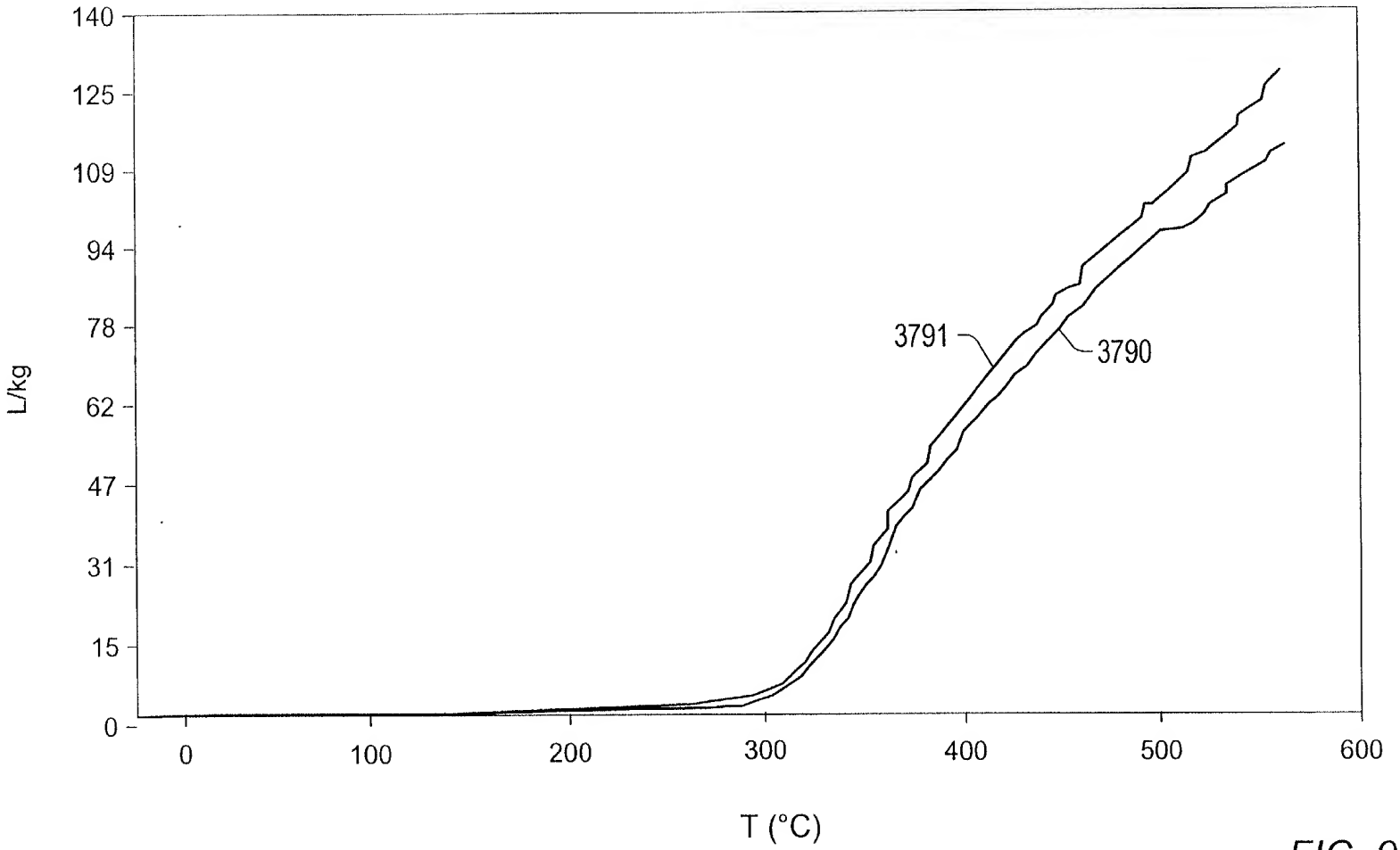
140
125
109
94
78
62
47
31
15
0
L/kg
0
100
200
300
400
500
600
T (°C)
3791
3790

FIG. 94

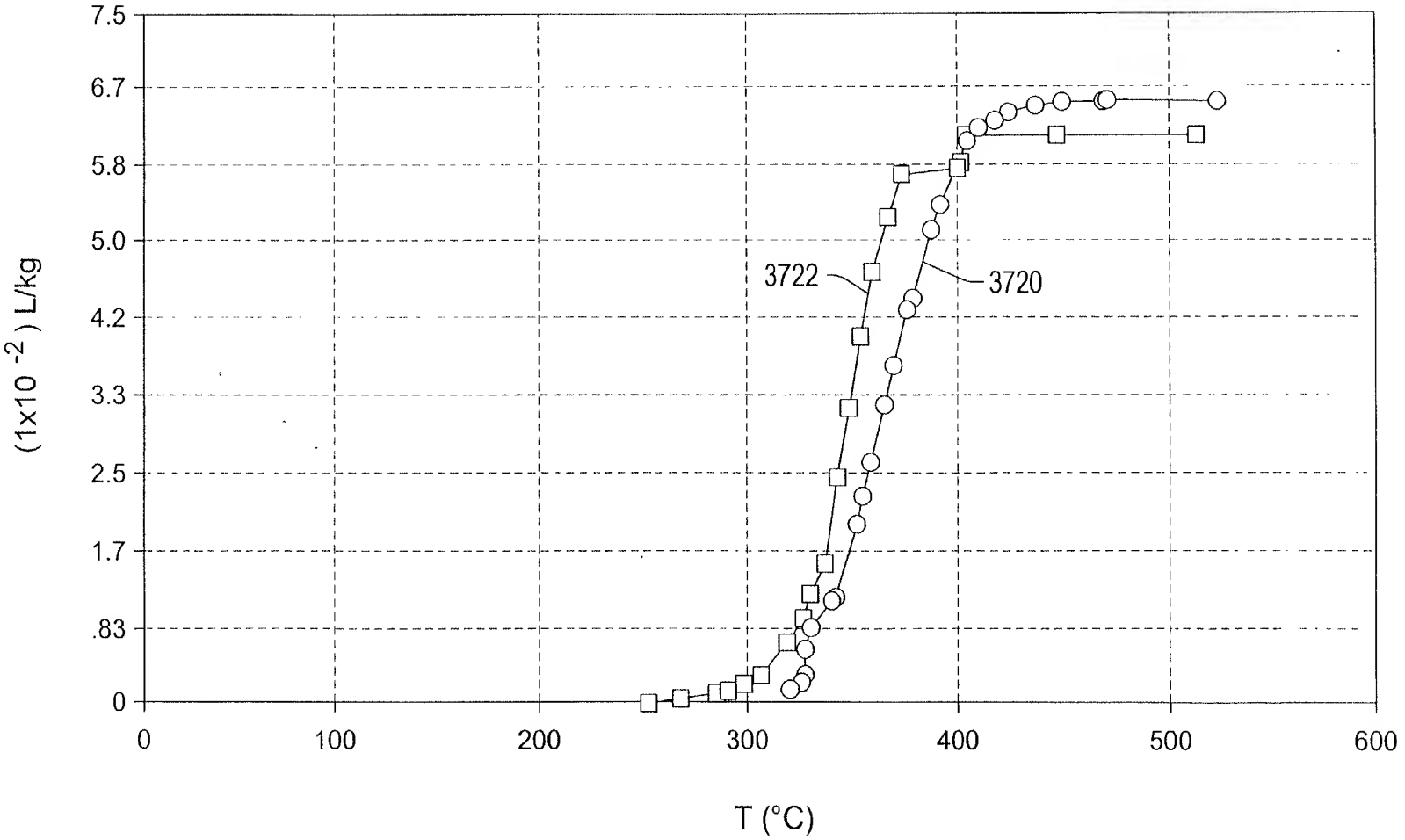
7.5
6.7
5.8
5.0
4.2
3.3
2.5
1.7
.83
0
(1x10 -2) L/kg
0
100
200
300
400
500
600
T (°C)
3722
3720

FIG. 95

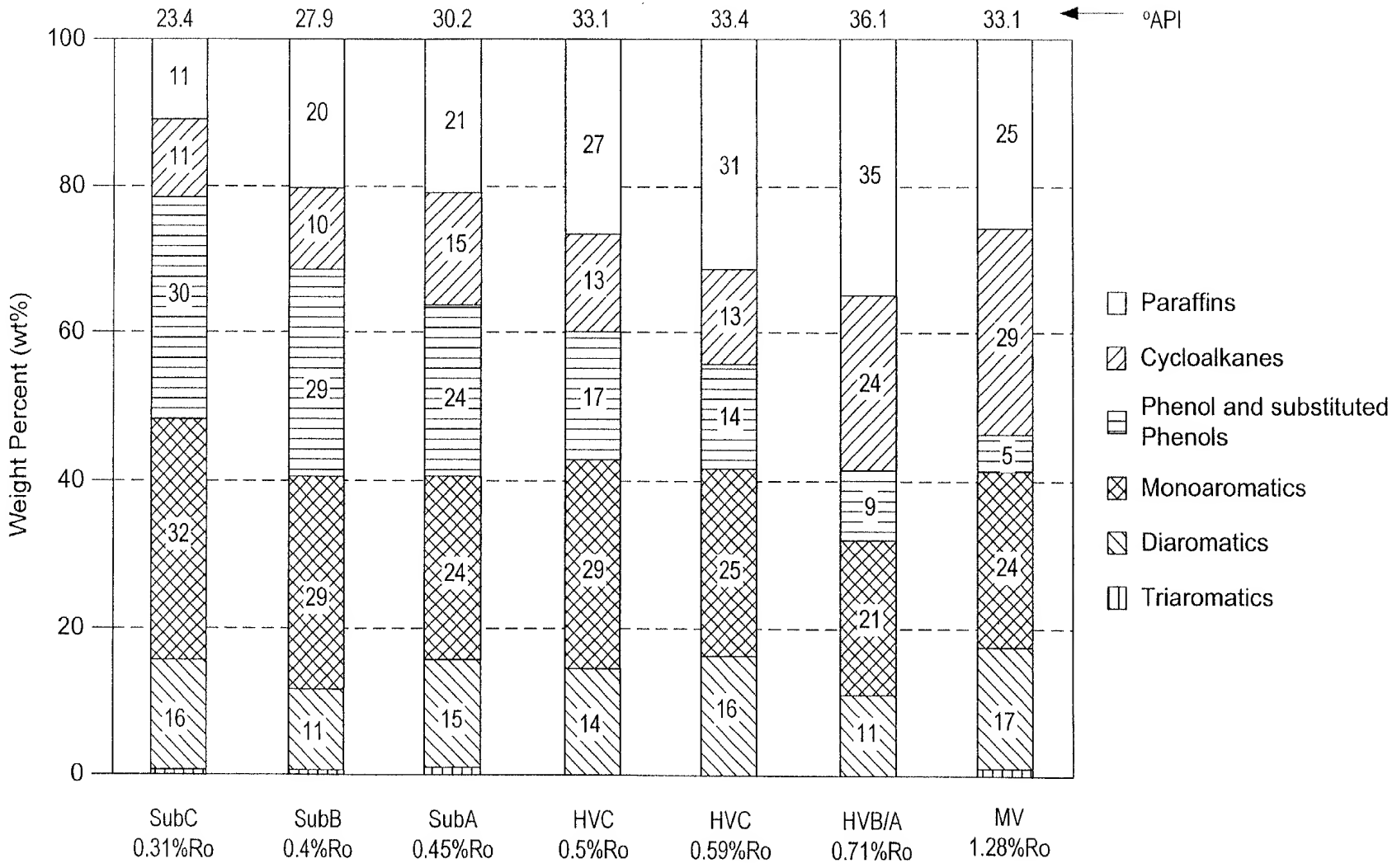
23.4
27.9
30.2
33.1
33.4
36.1
33.1
°API
100
80
60
40
20
0
Weight Percent (wt%)
11
11
30
32
16
20
10
29
29
11
21
15
24
24
15
27
13
17
29
14
31
13
14
25
16
35
24
9
21
11
25
29
5
24
17
SubC
0.31%Ro
SubB
0.4%Ro
SubA
0.45%Ro
HVC
0.5%Ro
HVC
0.59%Ro
HVB/A
0.71%Ro
MV
1.28%Ro
Paraffins
Cycloalkanes
Phenol and substituted Phenols
Monoaromatics
Diaromatics
Triaromatics

FIG. 96

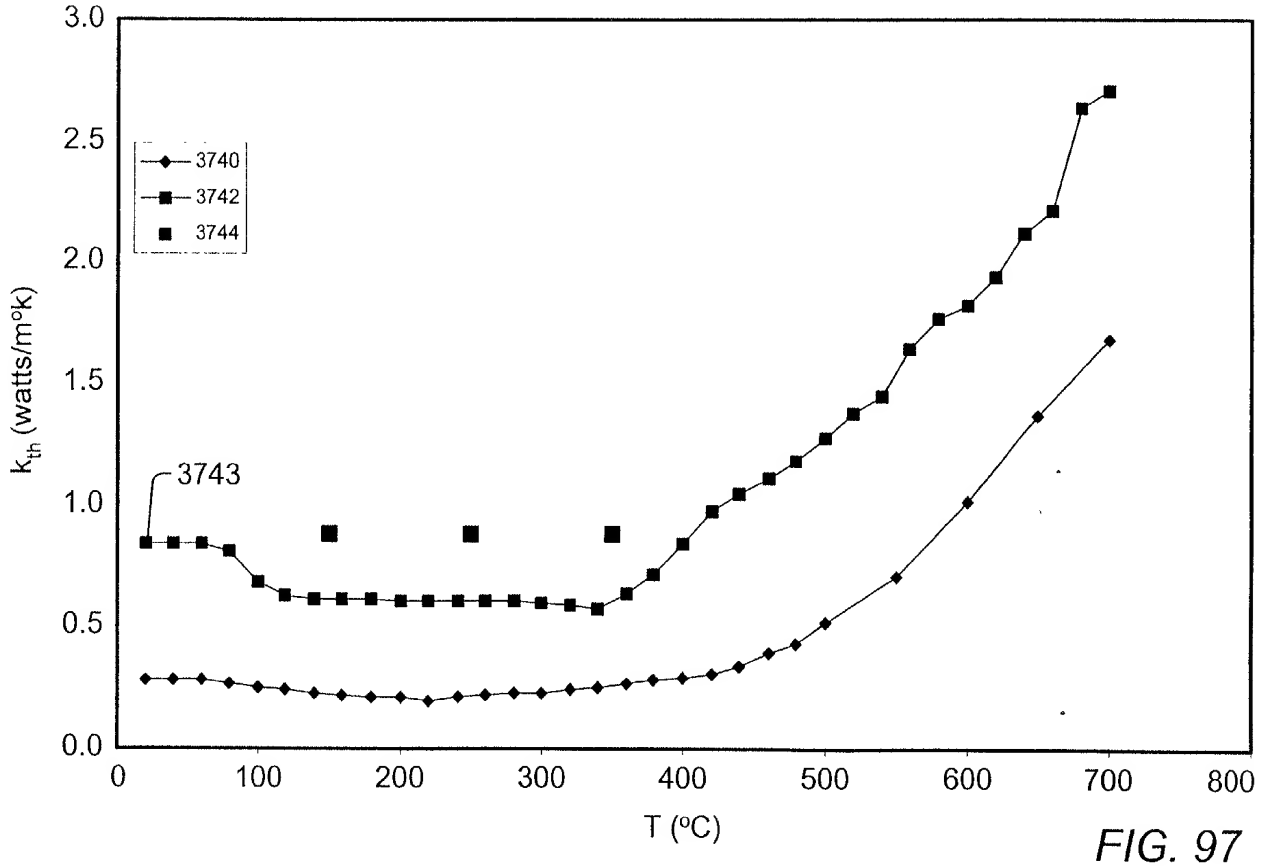
3.0
2.5
2.0
1.5
1.0
0.5
0.0
k_{th} (watts/m°K)
3740
3742
3744
3743
0
100
200
300
400
500
600
700
800
T (°C)

FIG. 97

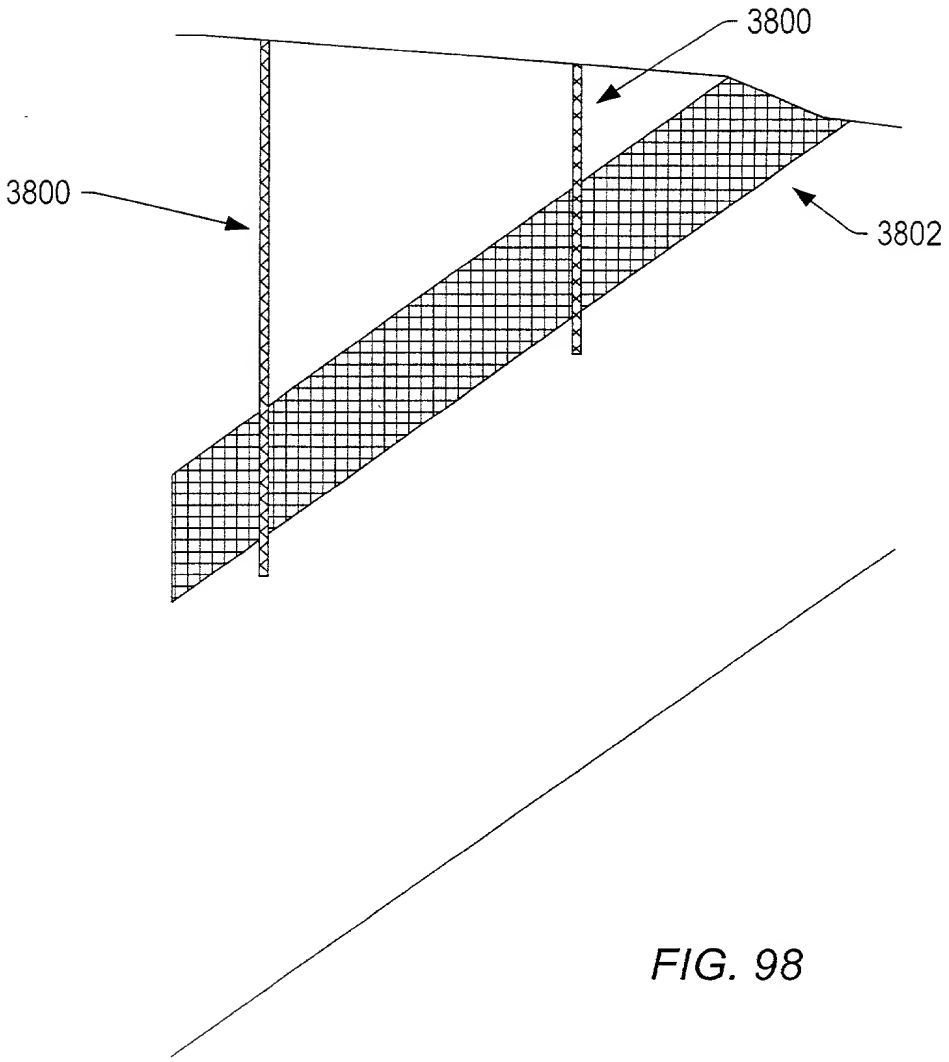

FIG. 98

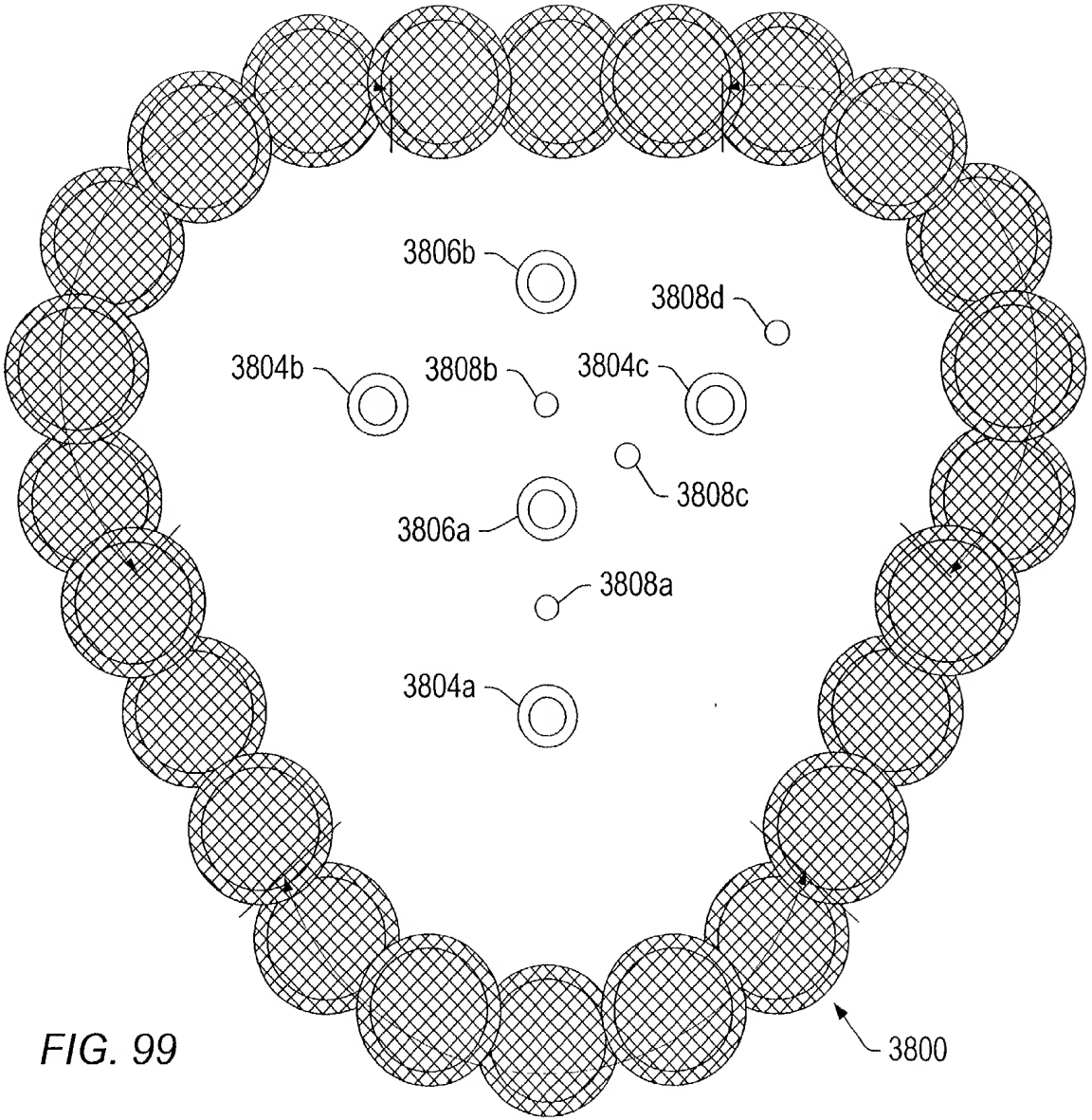

FIG. 99

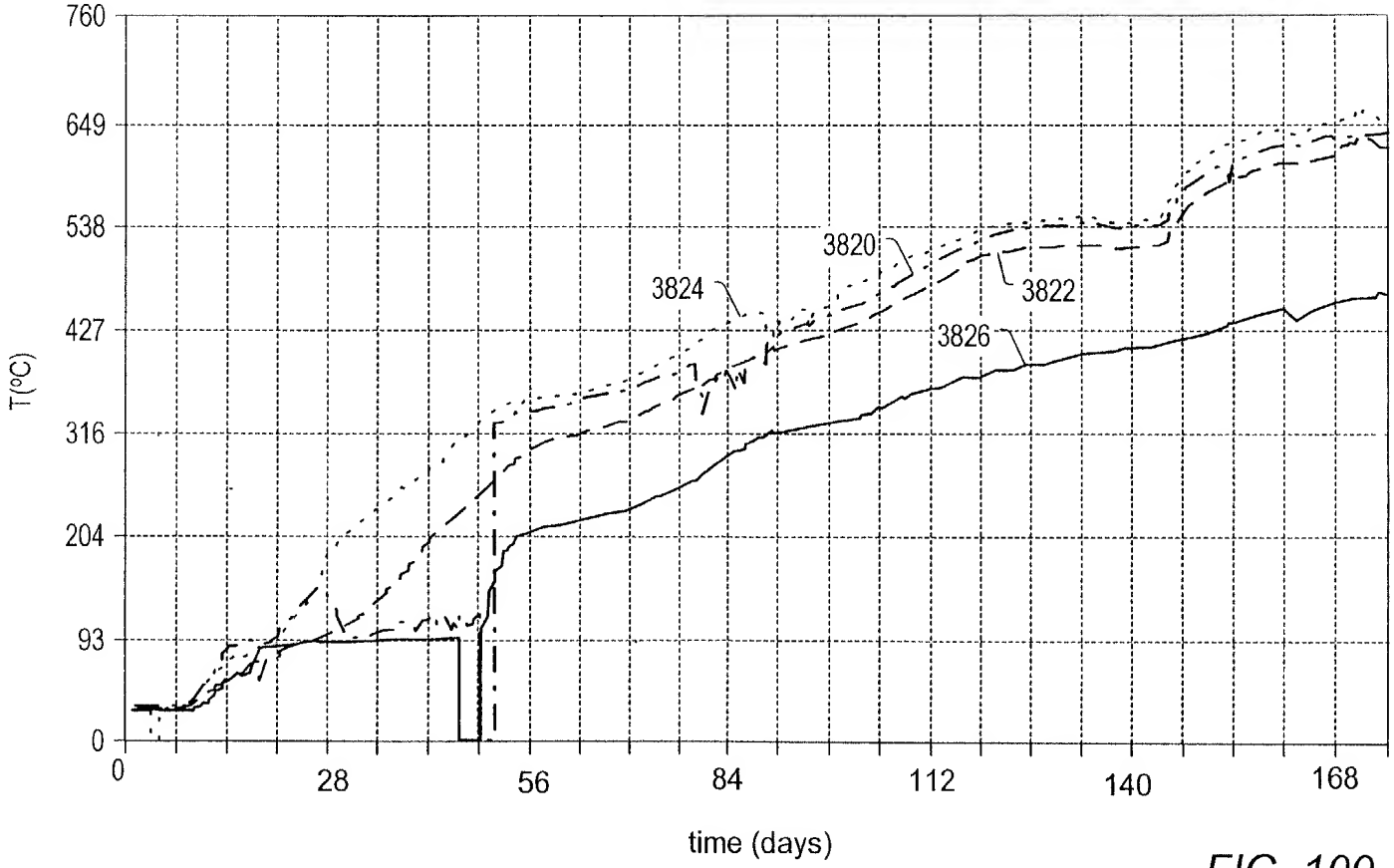
760
649
538
427
316
204
93
0
T(°C)
0
28
56
84
112
140
168
time (days)
3820
3822
3824
3826

FIG. 100

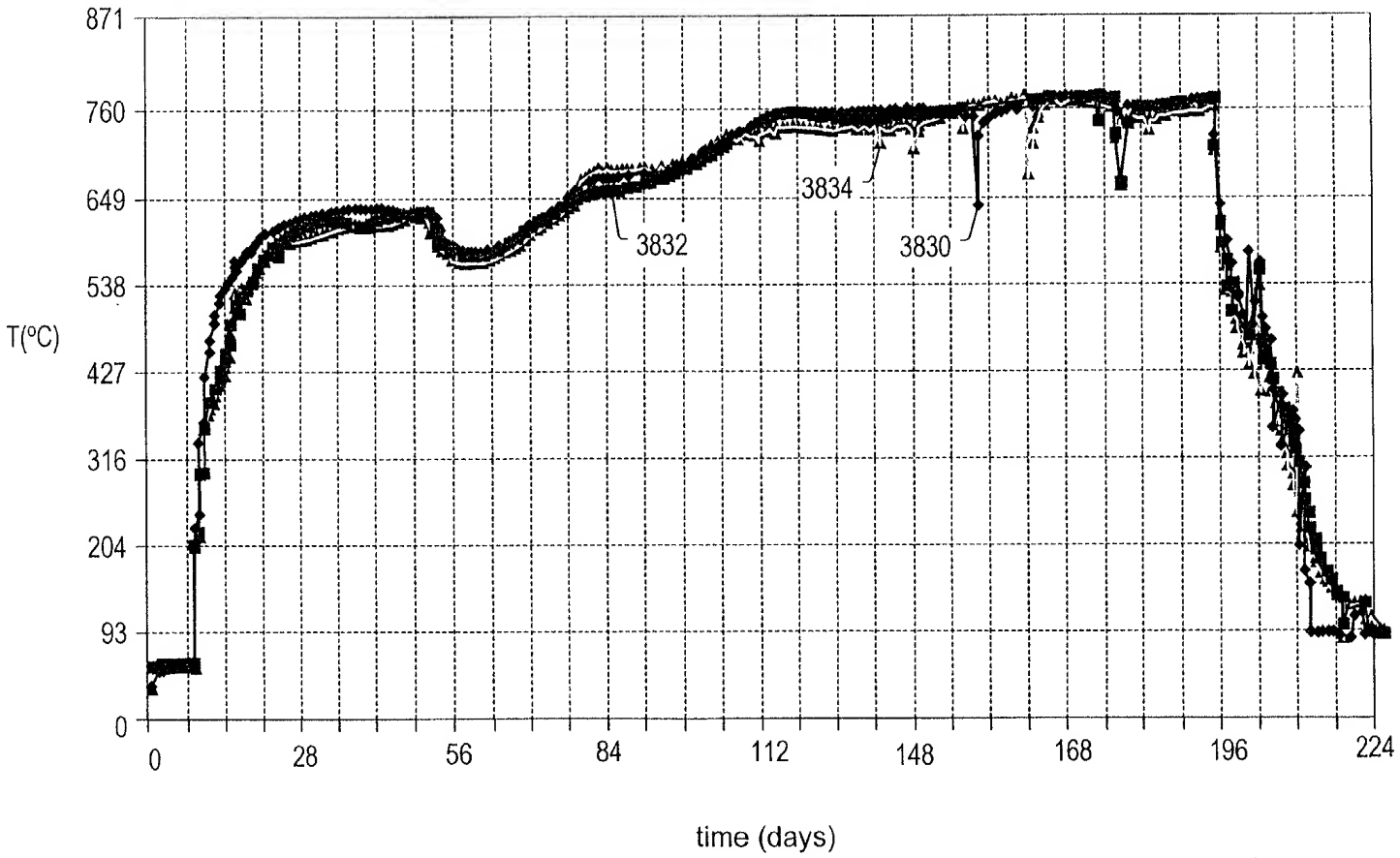
871
760
649
538
427
316
204
93
0
T(°C)
0
28
56
84
112
148
168
196
224
time (days)
3832
3834
3830

FIG. 101

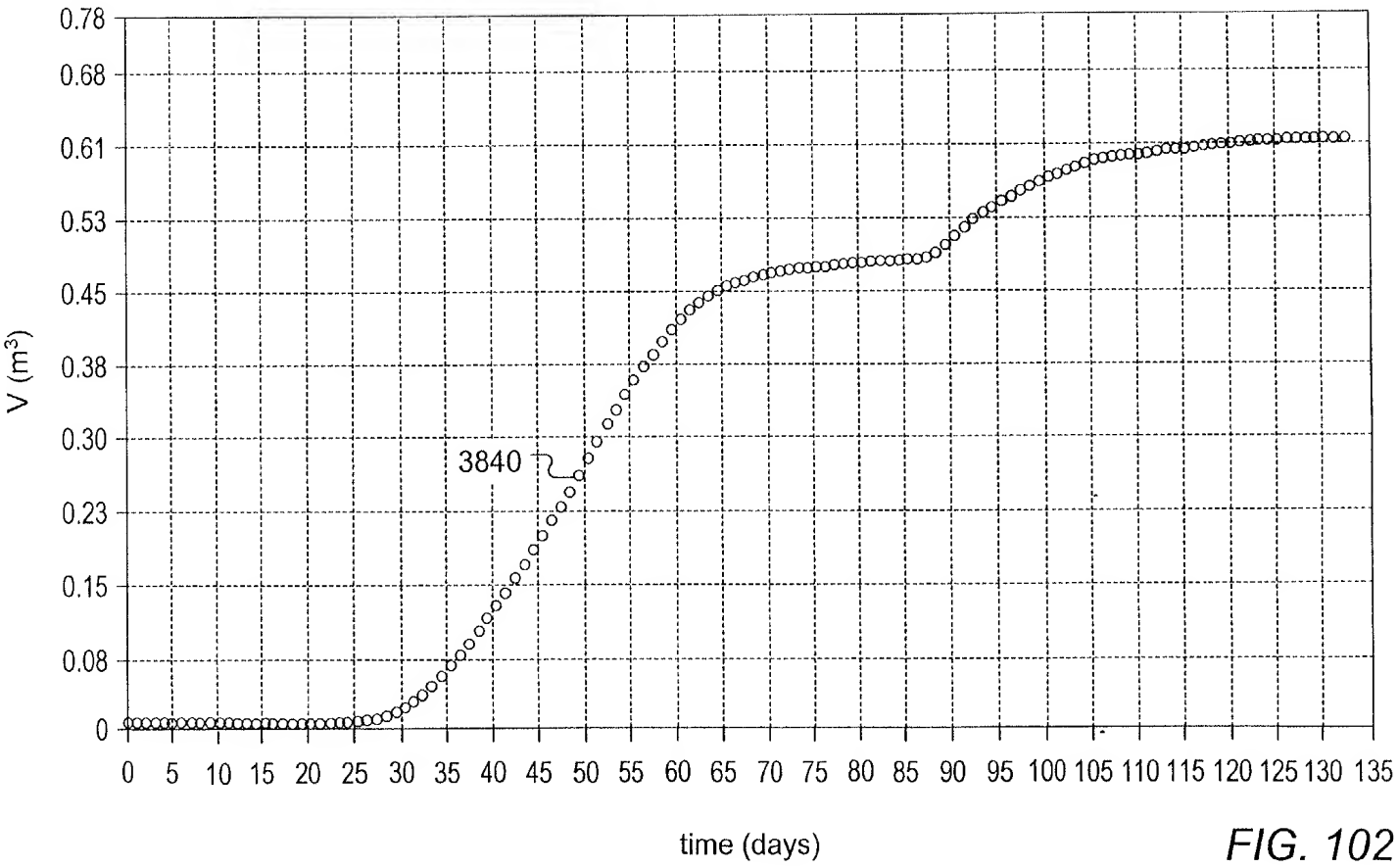
0.78
0.68
0.61
0.53
0.45
0.38
0.30
0.23
0.15
0.08
0
V (m3)
3840
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135
time (days)

FIG. 102

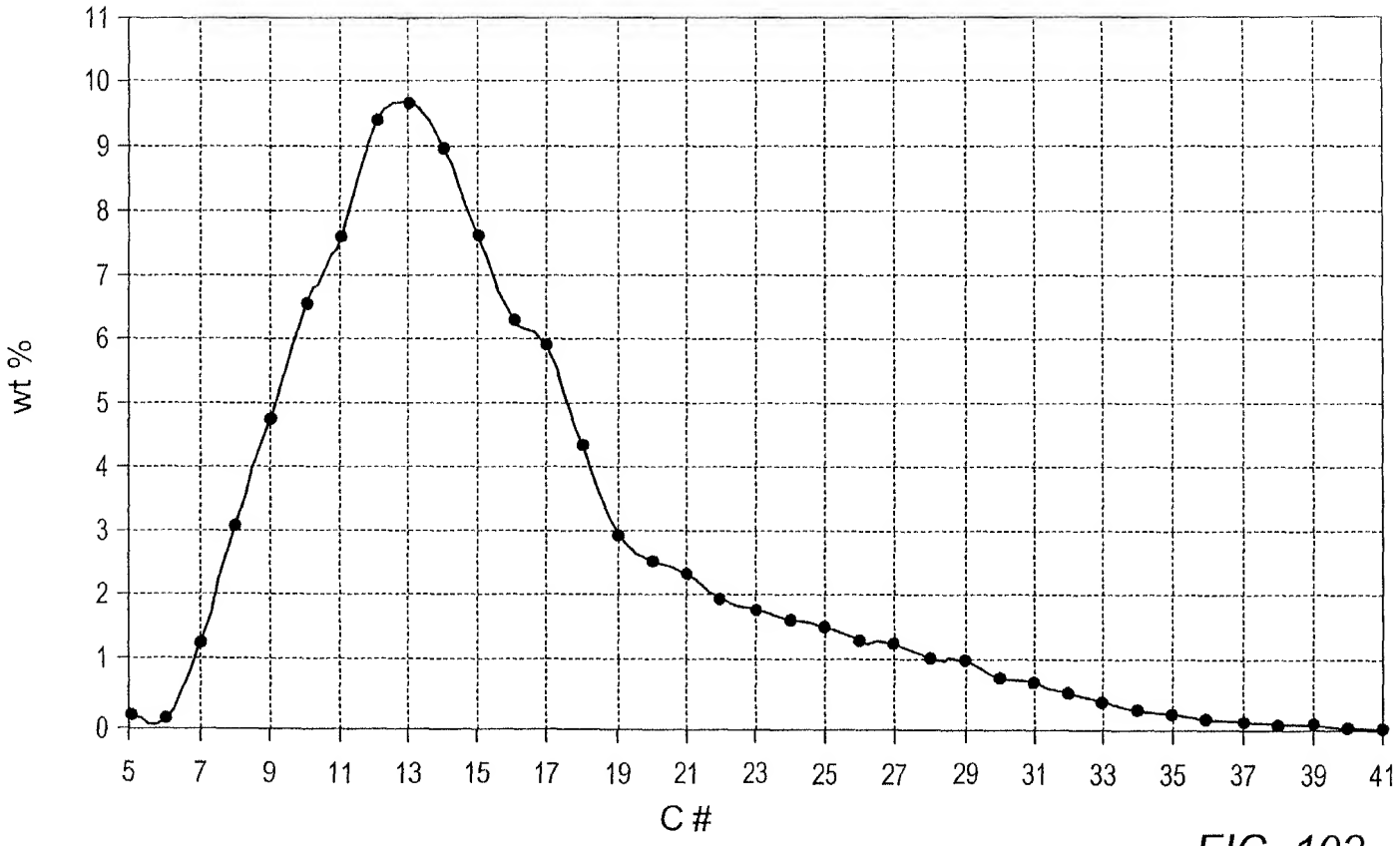
wt %
C #
0
1
2
3
4
5
6
7
8
9
10
11
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41

FIG. 103

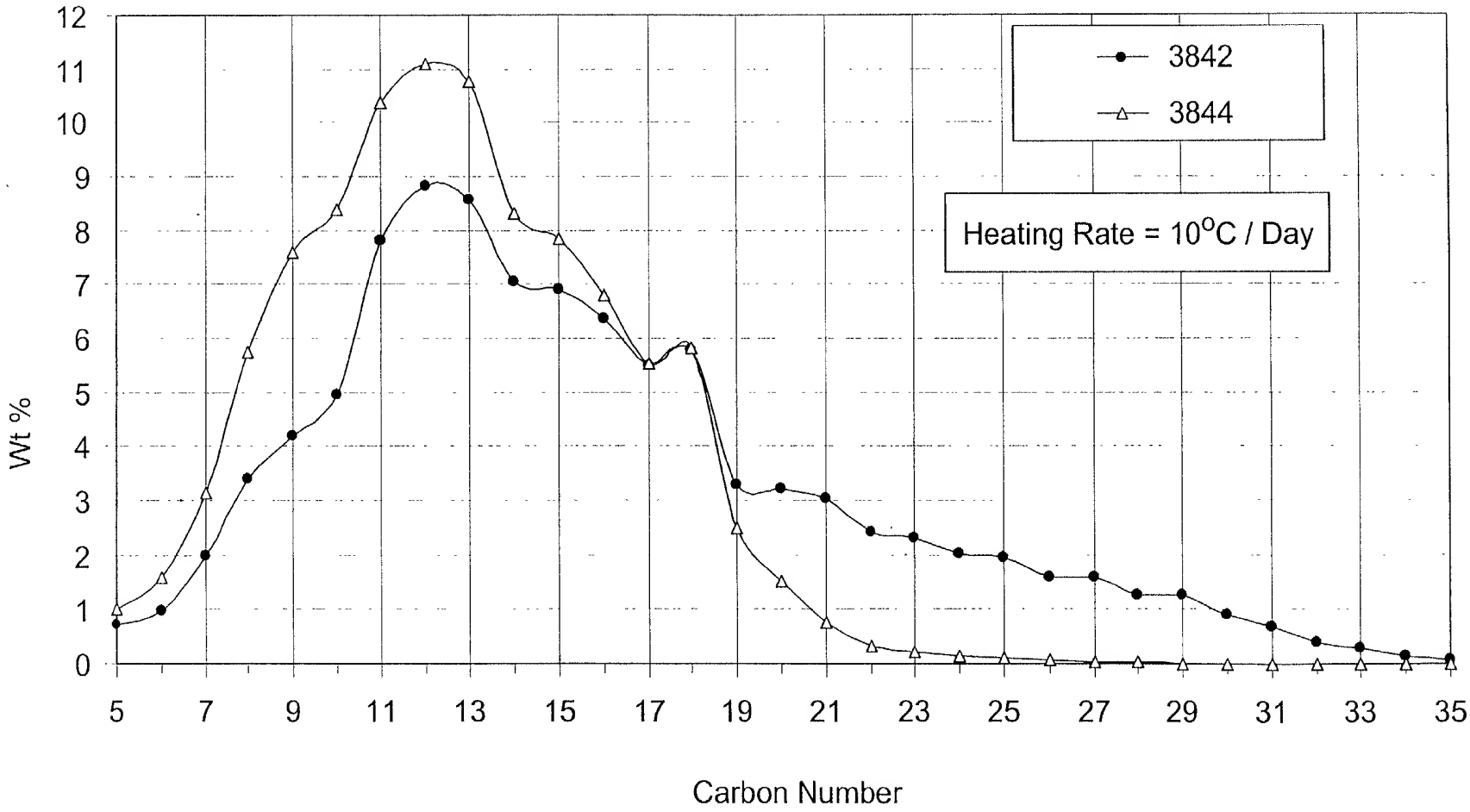
12
11
10
9
8
7
6
5
4
3
2
1
0
Wt %
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
Carbon Number
3842
3844
Heating Rate = 10°C / Day

FIG. 104

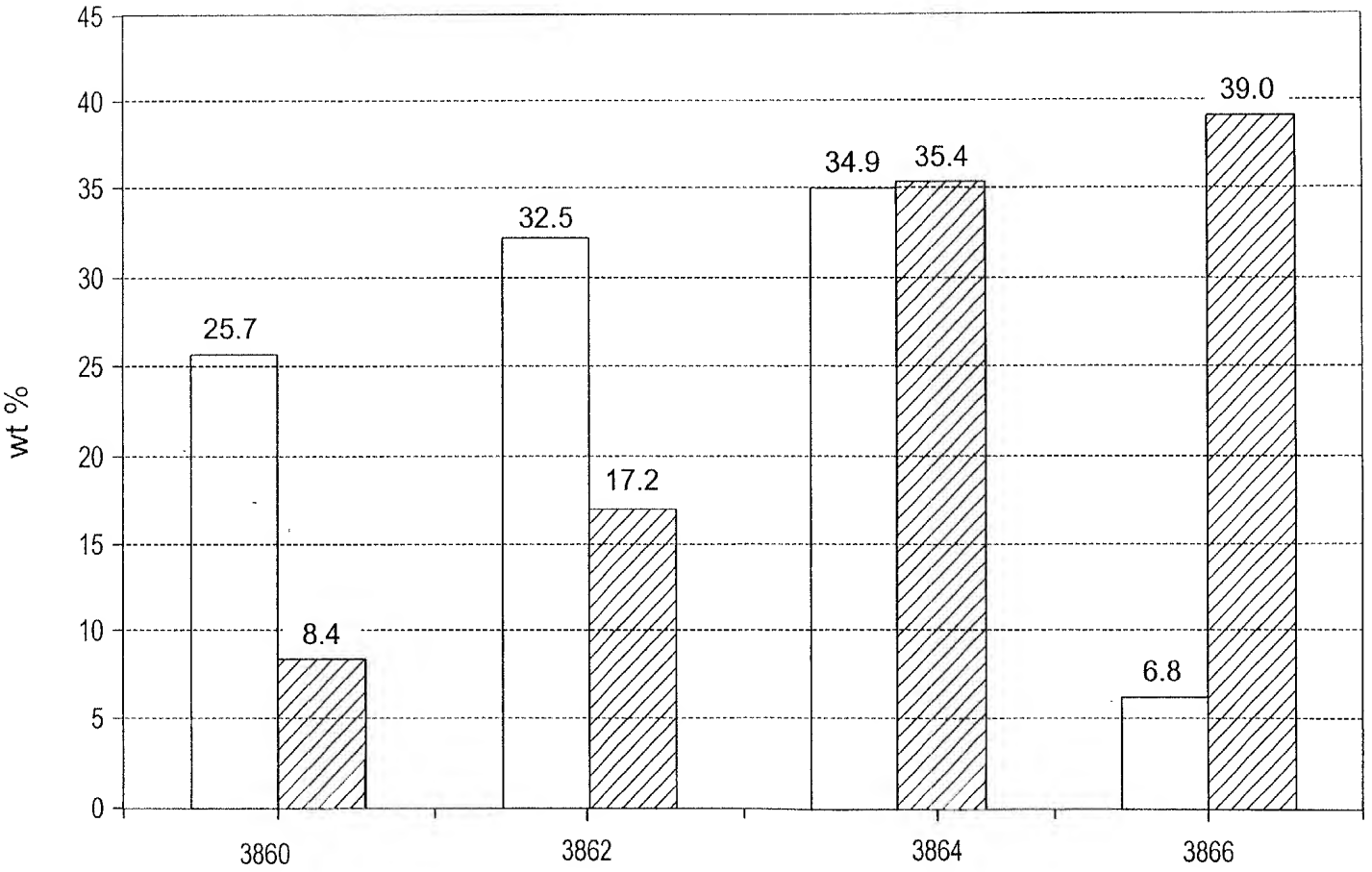
45
40
35
30
25
20
15
10
5
0
wt %
25.7
8.4
32.5
17.2
34.9
35.4
6.8
39.0
3860
3862
3864
3866

FIG. 105

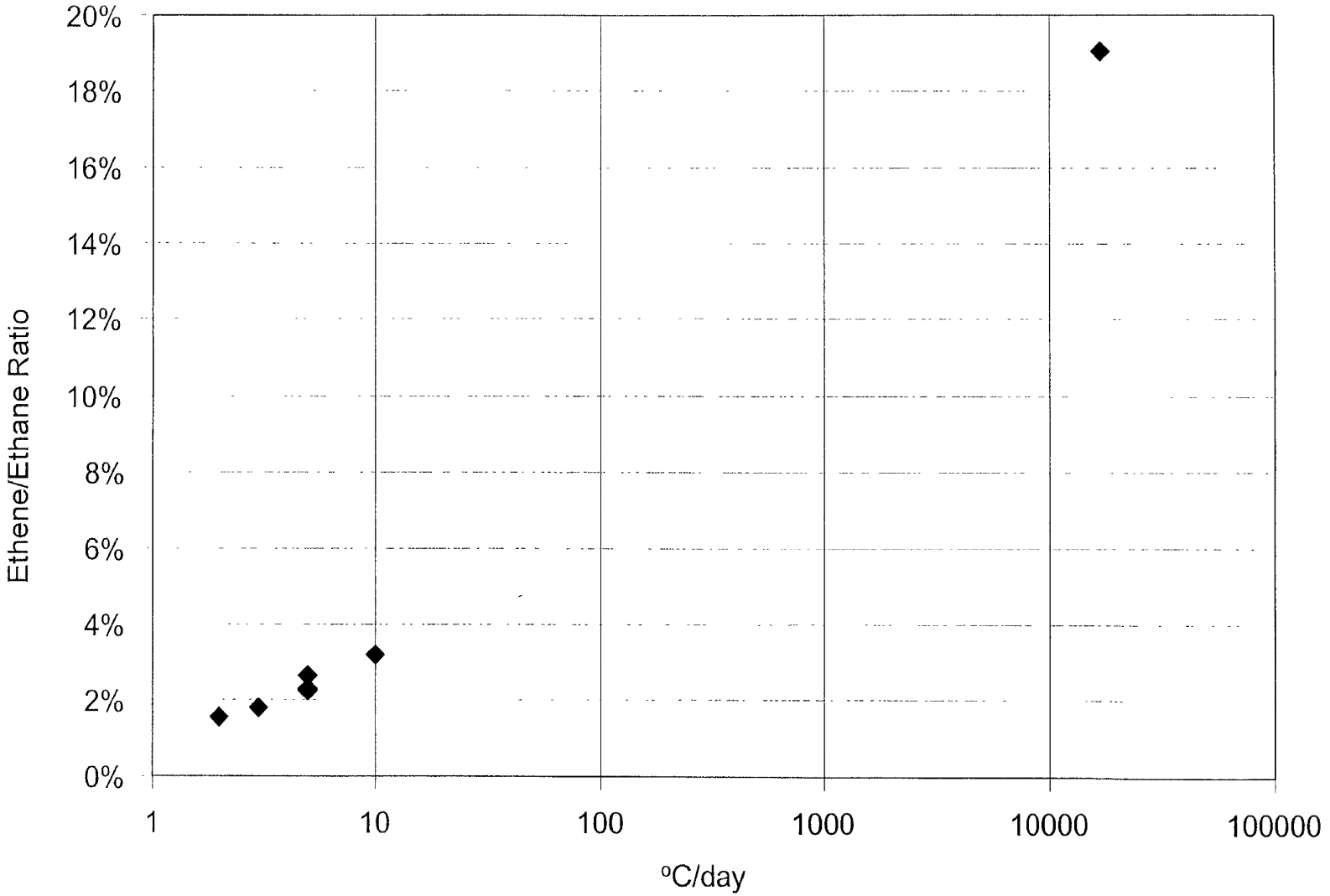
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Ethene/Ethane Ratio
1
10
100
1000
10000
100000
°C/day

FIG. 106

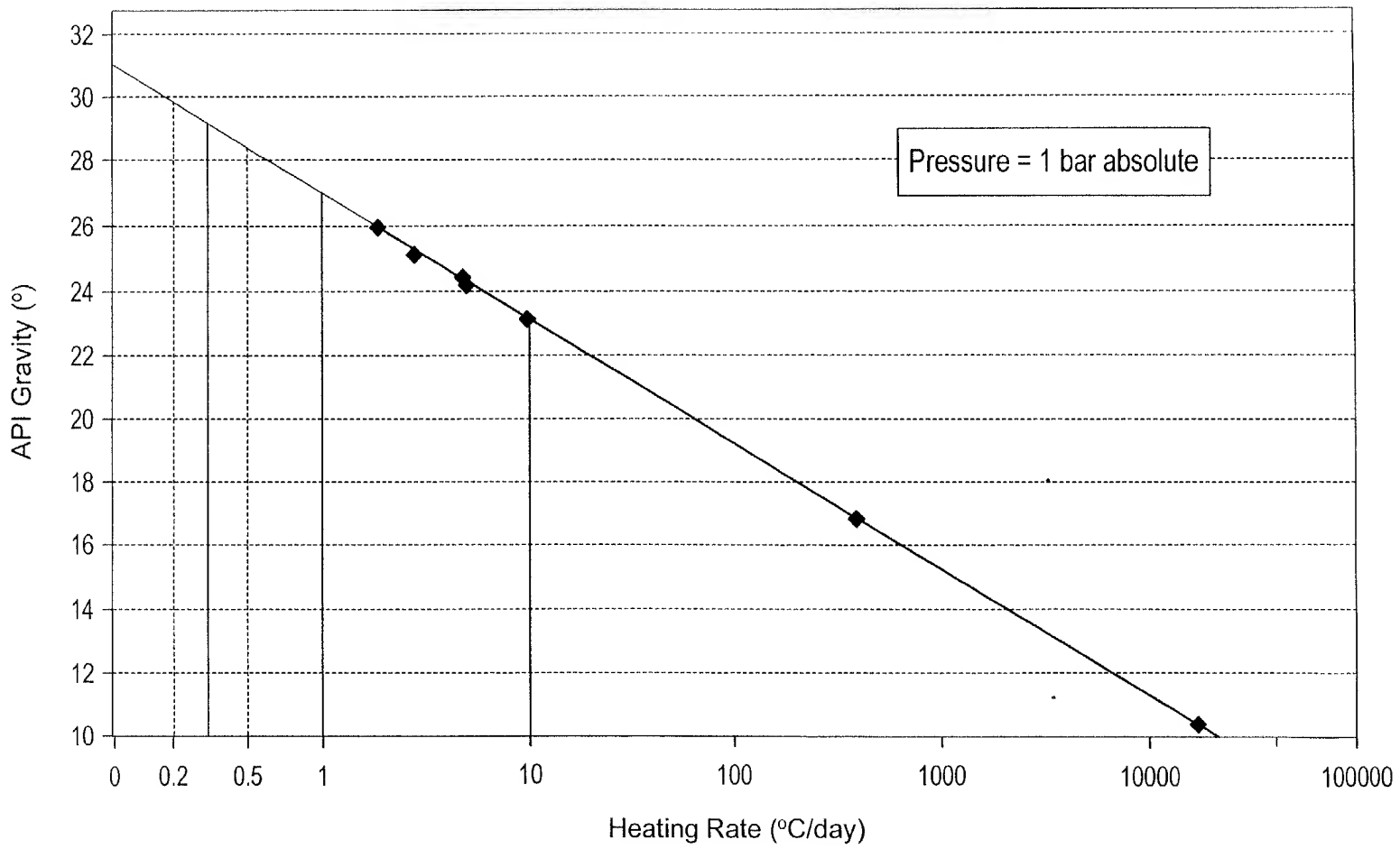
Pressure = 1 bar absolute
API Gravity (°)
32
30
28
26
24
22
20
18
16
14
12
10
0
0.2
0.5
1
10
100
1000
10000
100000
Heating Rate (°C/day)

FIG. 107

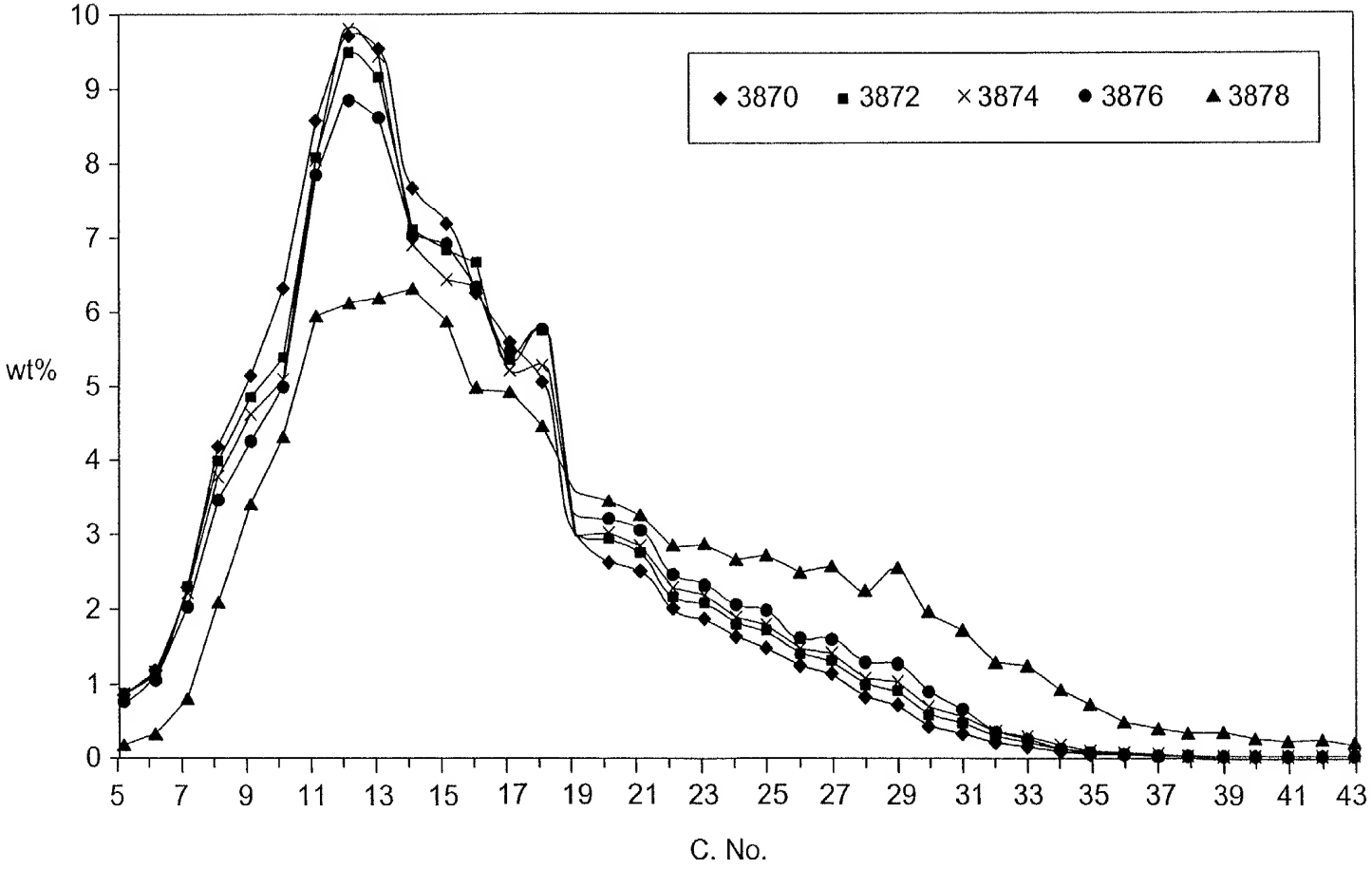
10
9
8
7
6
5
4
3
2
1
0
wt%
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
C. No.
◆ 3870
■ 3872
× 3874
● 3876
▲ 3878

FIG. 108

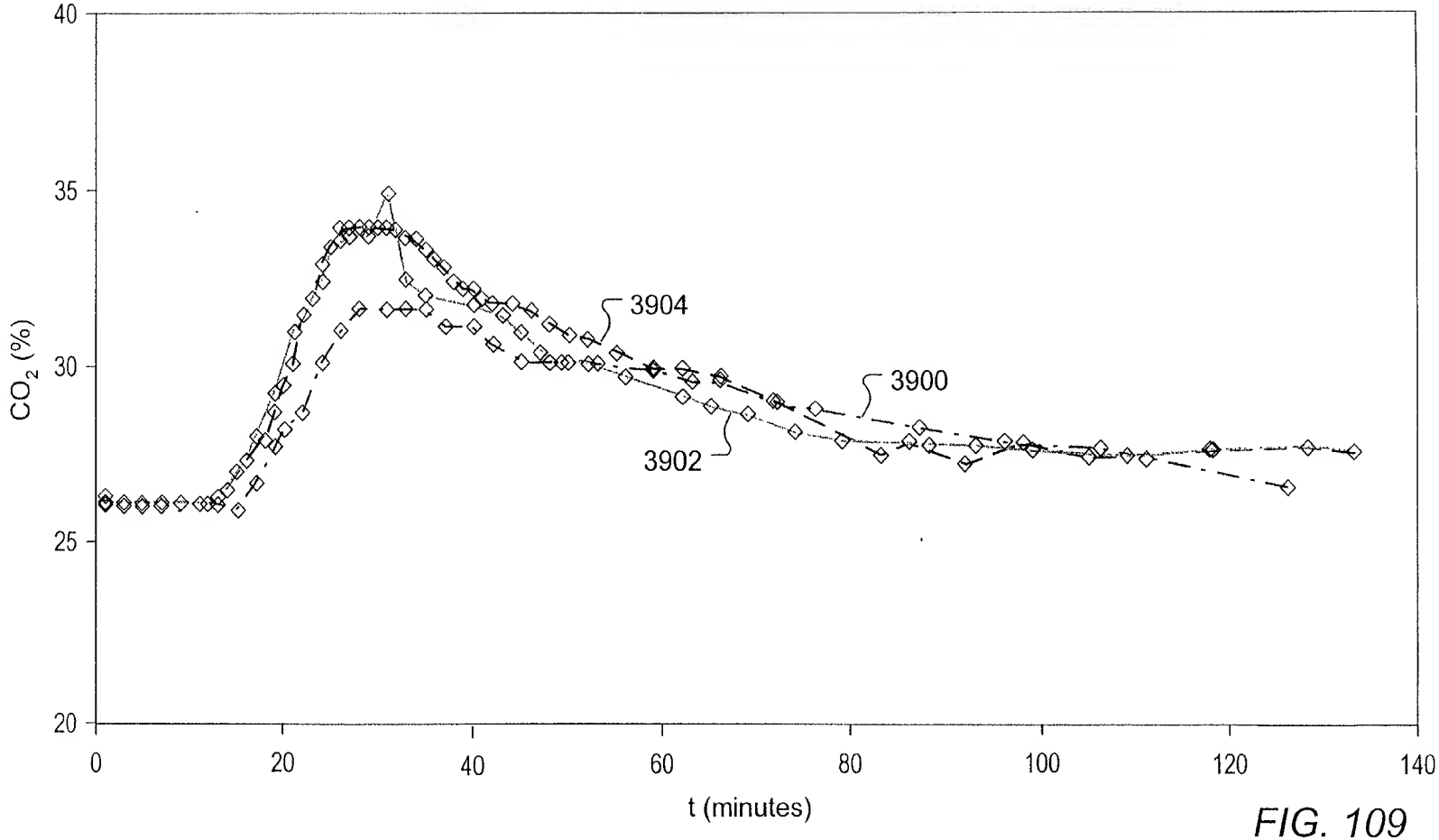
40
35
30
25
20
CO_2 (%)
0
20
40
60
80
100
120
140
t (minutes)
3904
3900
3902

FIG. 109

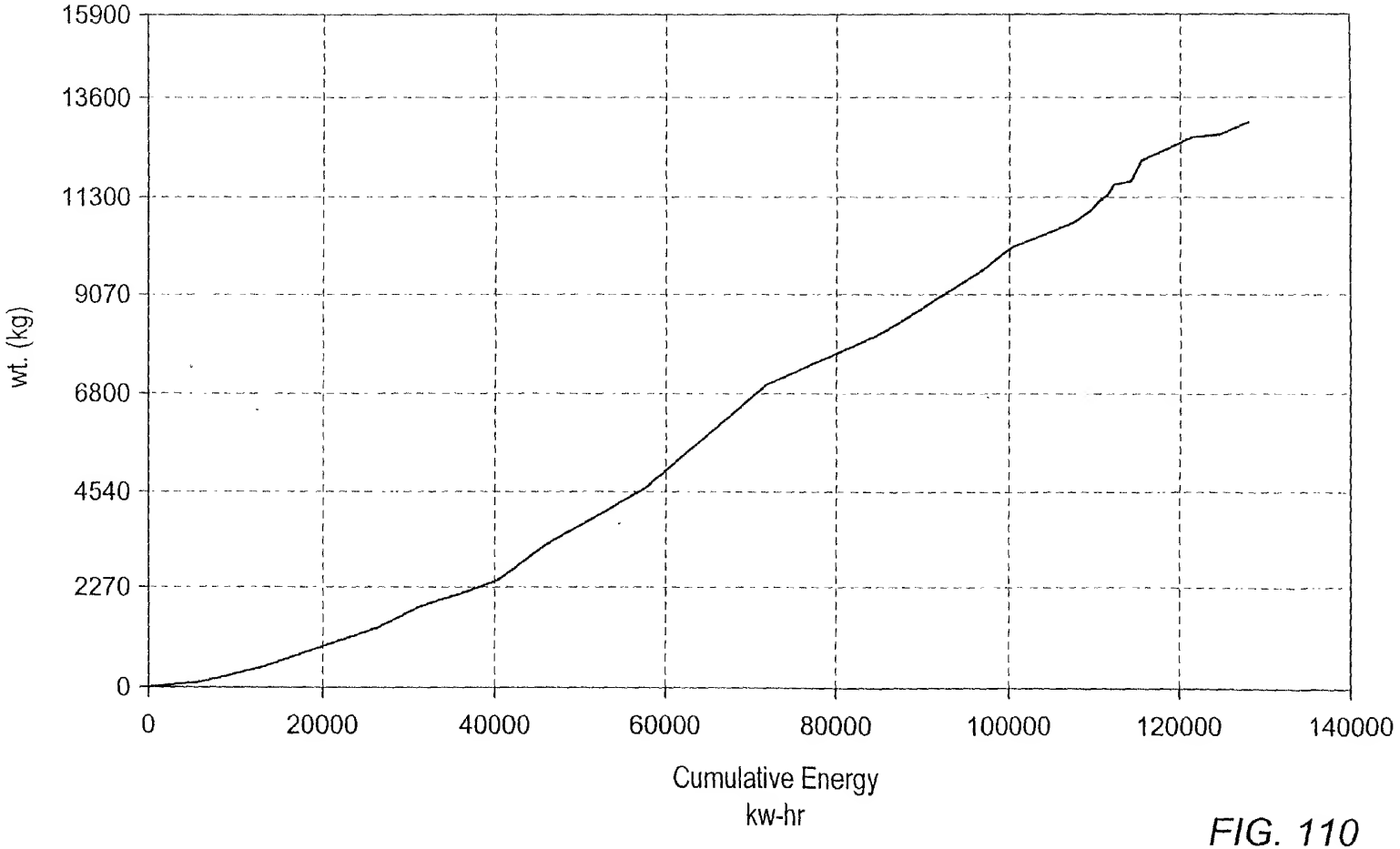
15900
13600
11300
9070
6800
4540
2270
0
wt. (kg)
0
20000
40000
60000
80000
100000
120000
140000
Cumulative Energy
kw-hr

FIG. 110

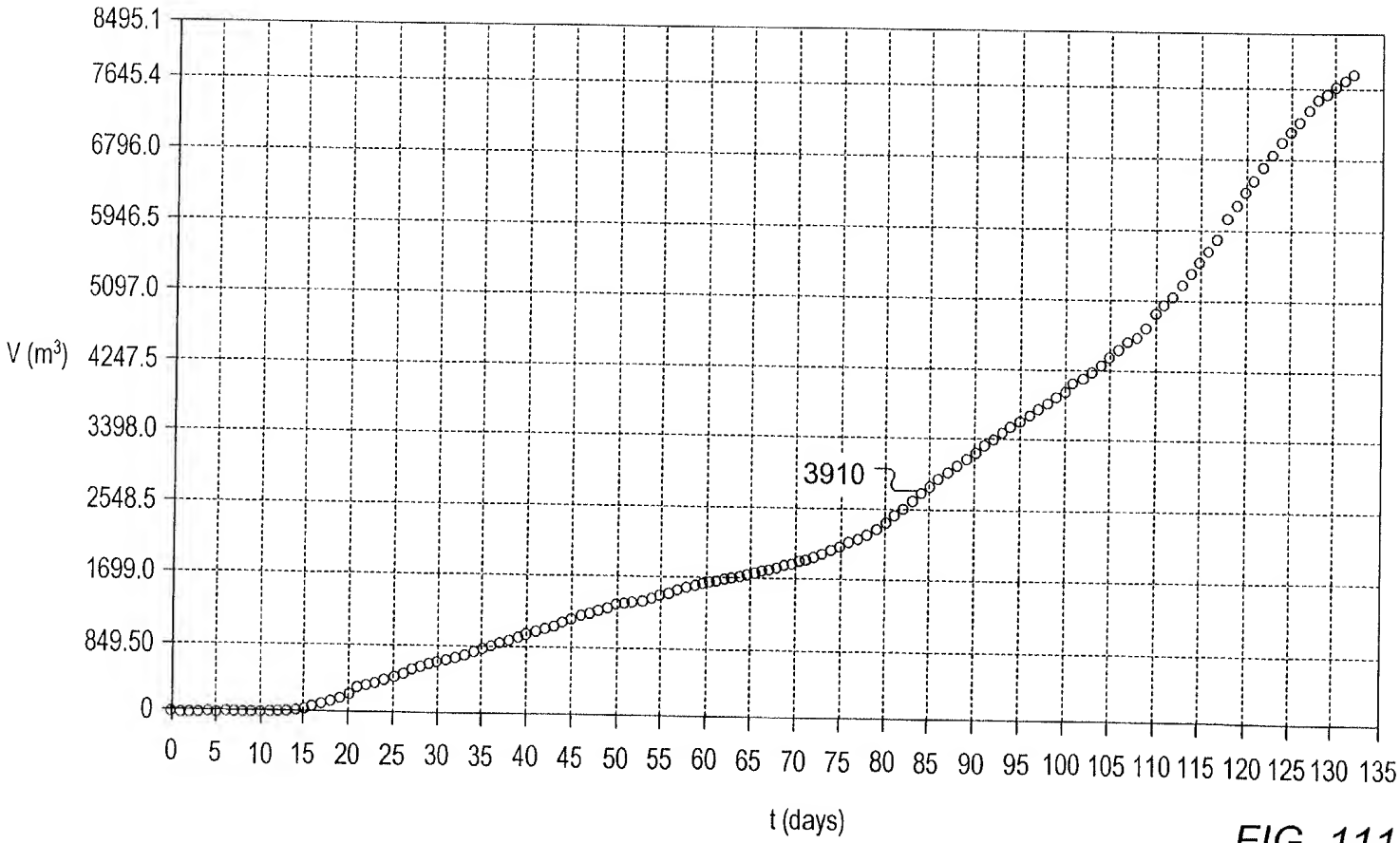
8495.1
7645.4
6796.0
5946.5
5097.0
4247.5
3398.0
2548.5
1699.0
849.50
0
V (m³)
3910
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135
t (days)

FIG. 111

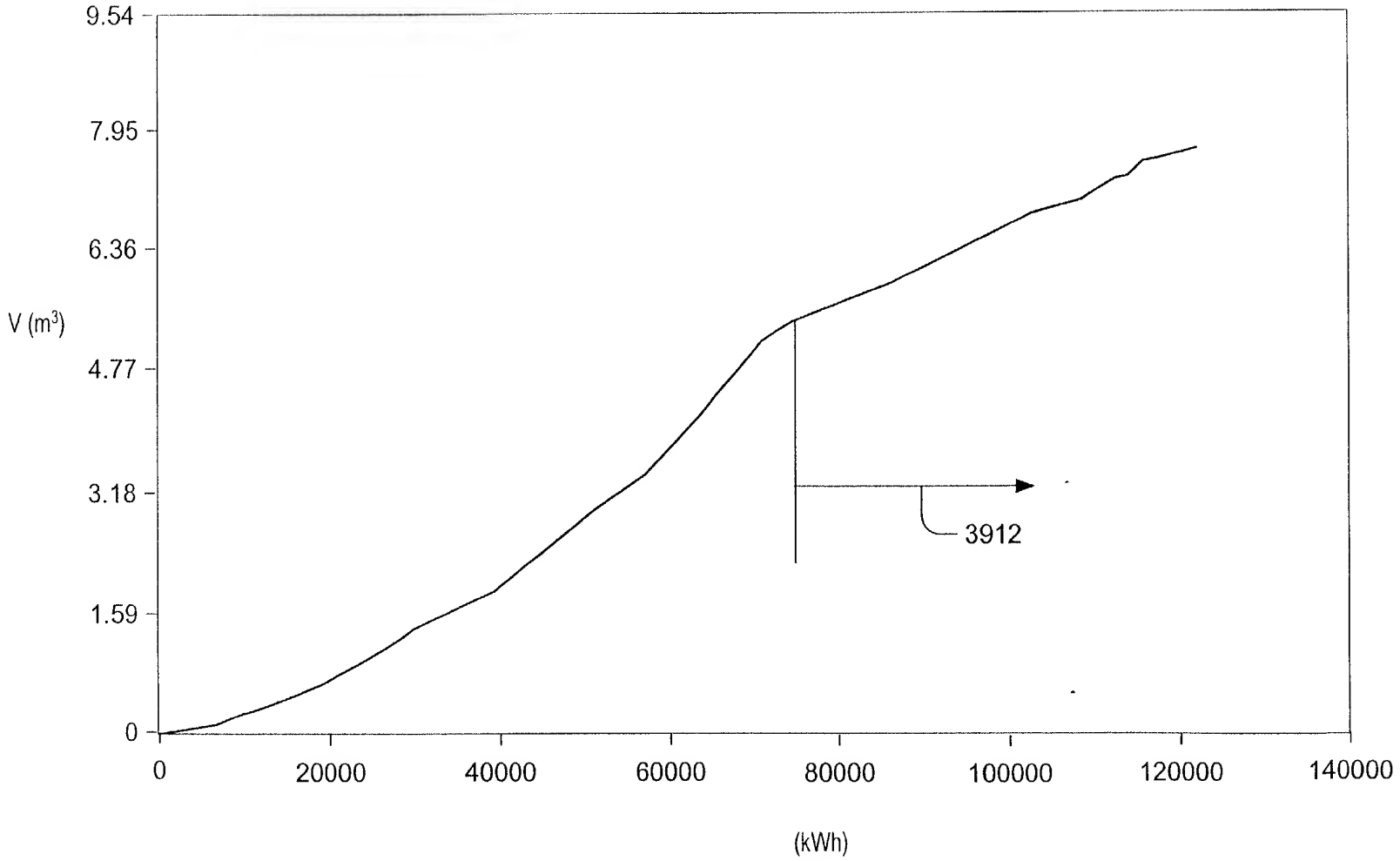
9.54
7.95
6.36
4.77
3.18
1.59
0
V (m³)
0
20000
40000
60000
80000
100000
120000
140000
(kWh)
3912

FIG. 112

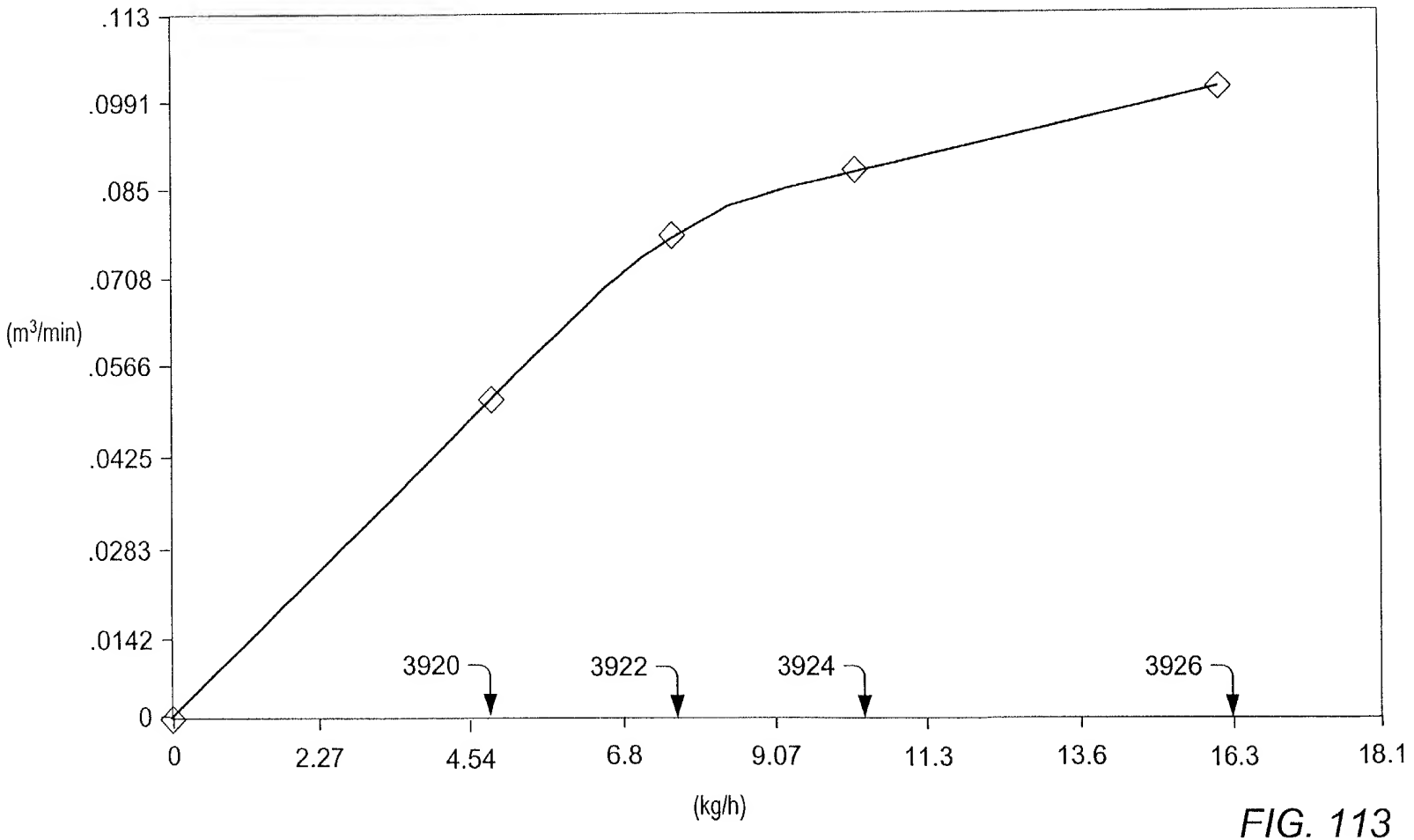
.113
.0991
.085
.0708
(m3/min)
.0566
.0425
.0283
.0142
0
3920
3922
3924
3926
0
2.27
4.54
6.8
9.07
11.3
13.6
16.3
18.1
(kg/h)

FIG. 113

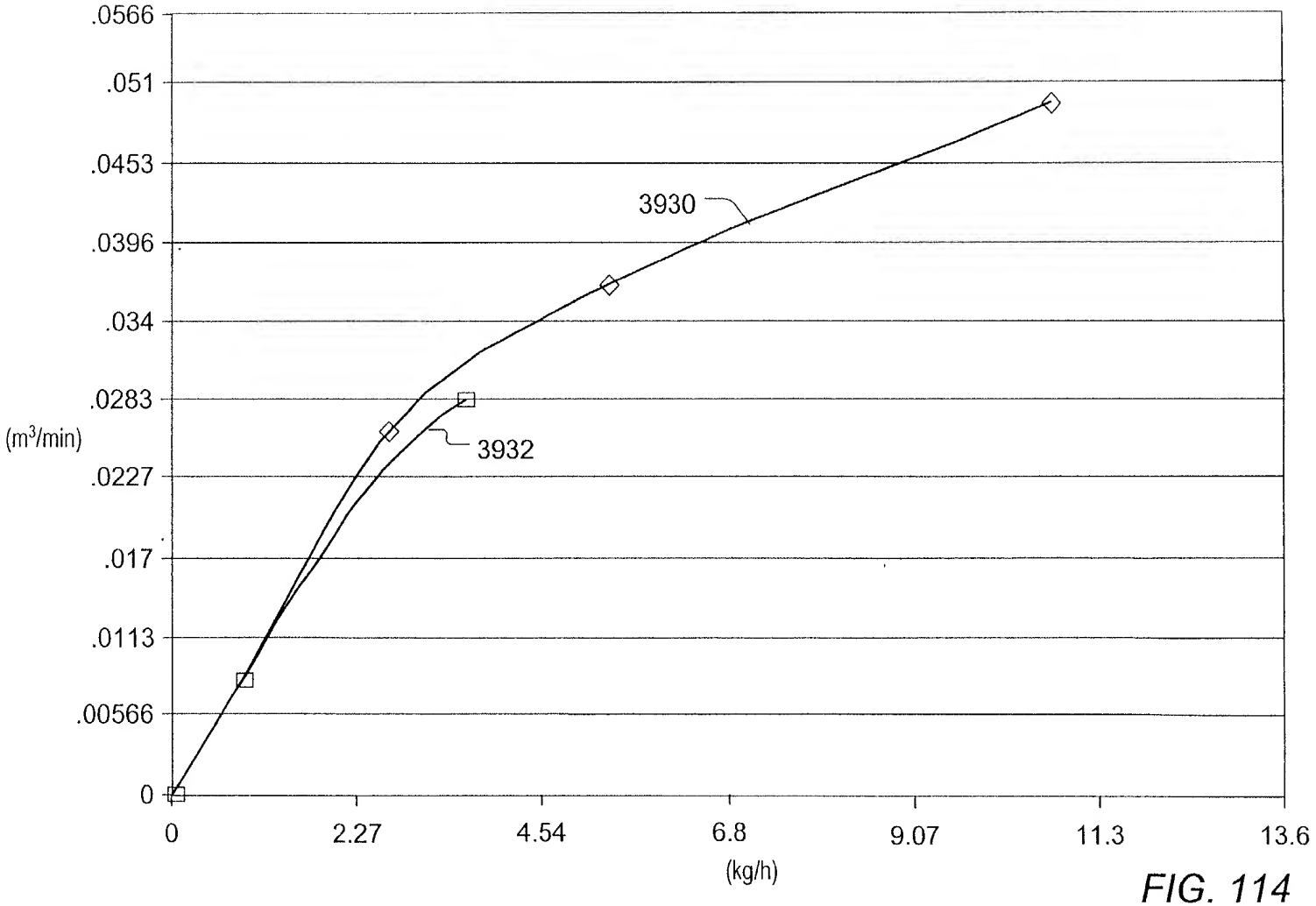
.0566
.051
.0453
.0396
.034
.0283
.0227
.017
.0113
.00566
0
(m³/min)
3930
3932
0
2.27
4.54
6.8
9.07
11.3
13.6
(kg/h)

FIG. 114

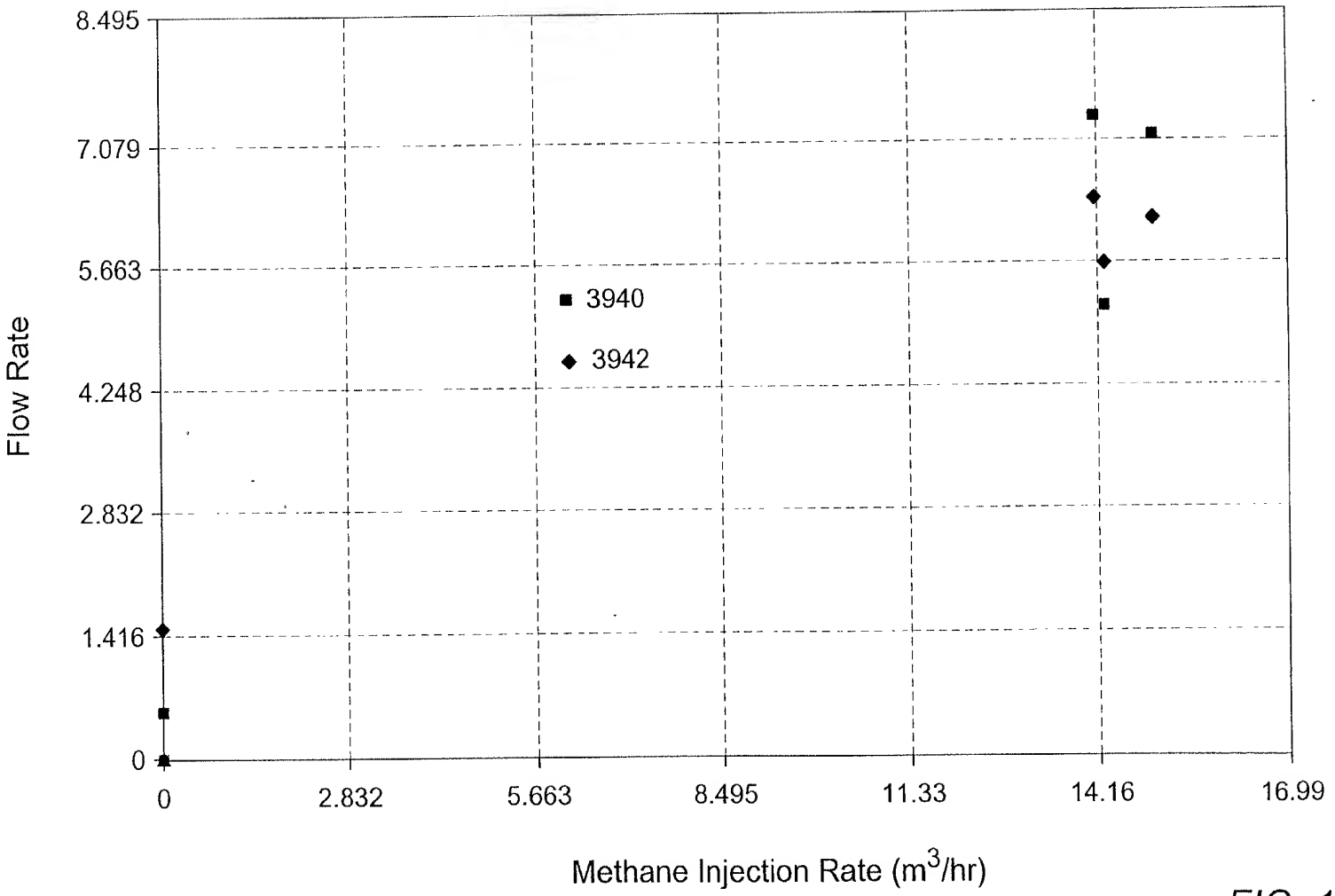
8.495
7.079
5.663
4.248
2.832
1.416
0
Flow Rate
3940
3942
0
2.832
5.663
8.495
11.33
14.16
16.99
Methane Injection Rate (m3/hr)

FIG. 115

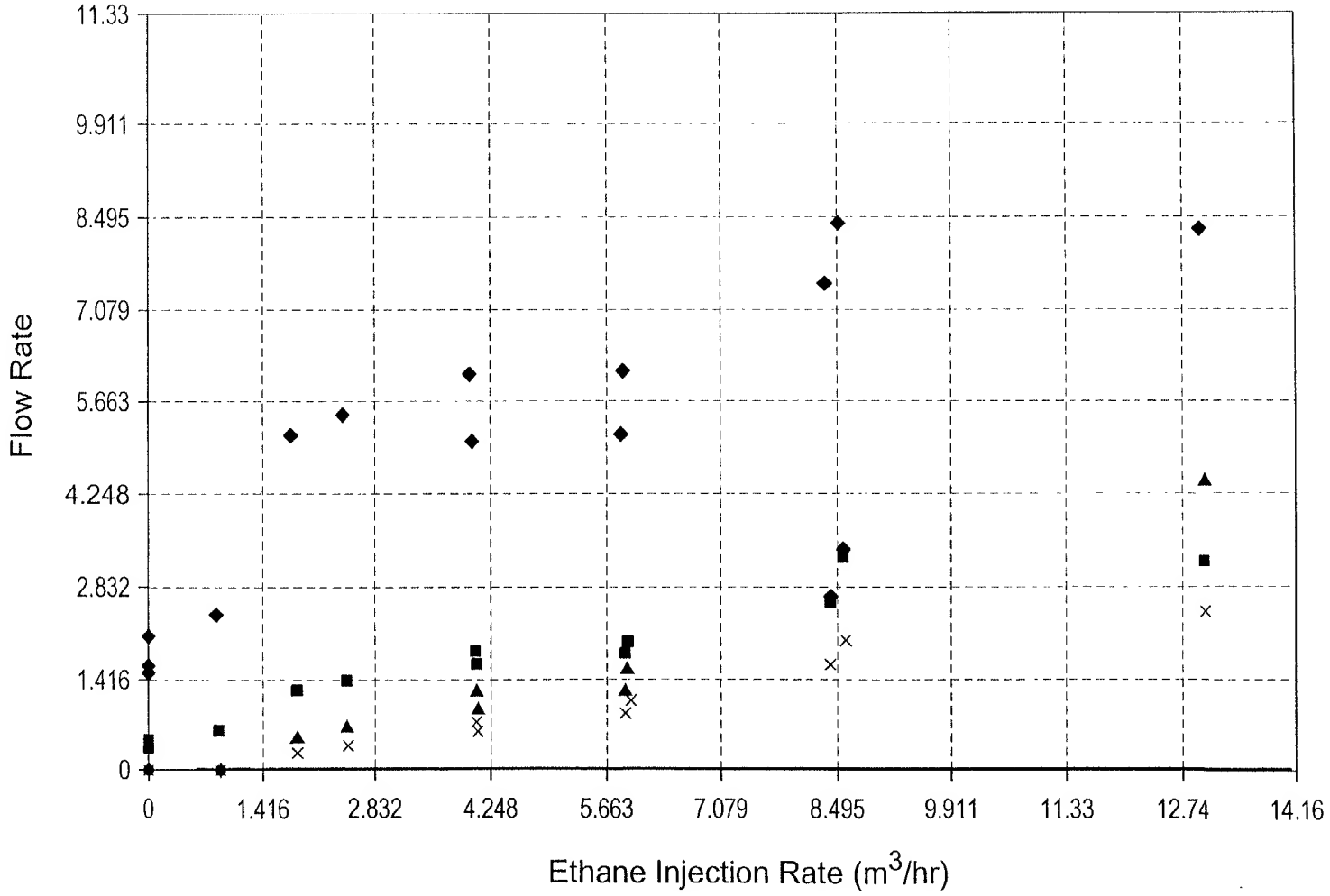
11.33
9.911
8.495
7.079
5.663
4.248
2.832
1.416
0
Flow Rate
0
1.416
2.832
4.248
5.663
7.079
8.495
9.911
11.33
12.74
14.16
Ethane Injection Rate (m3/hr)
3950
3952
3954
3956

FIG. 116

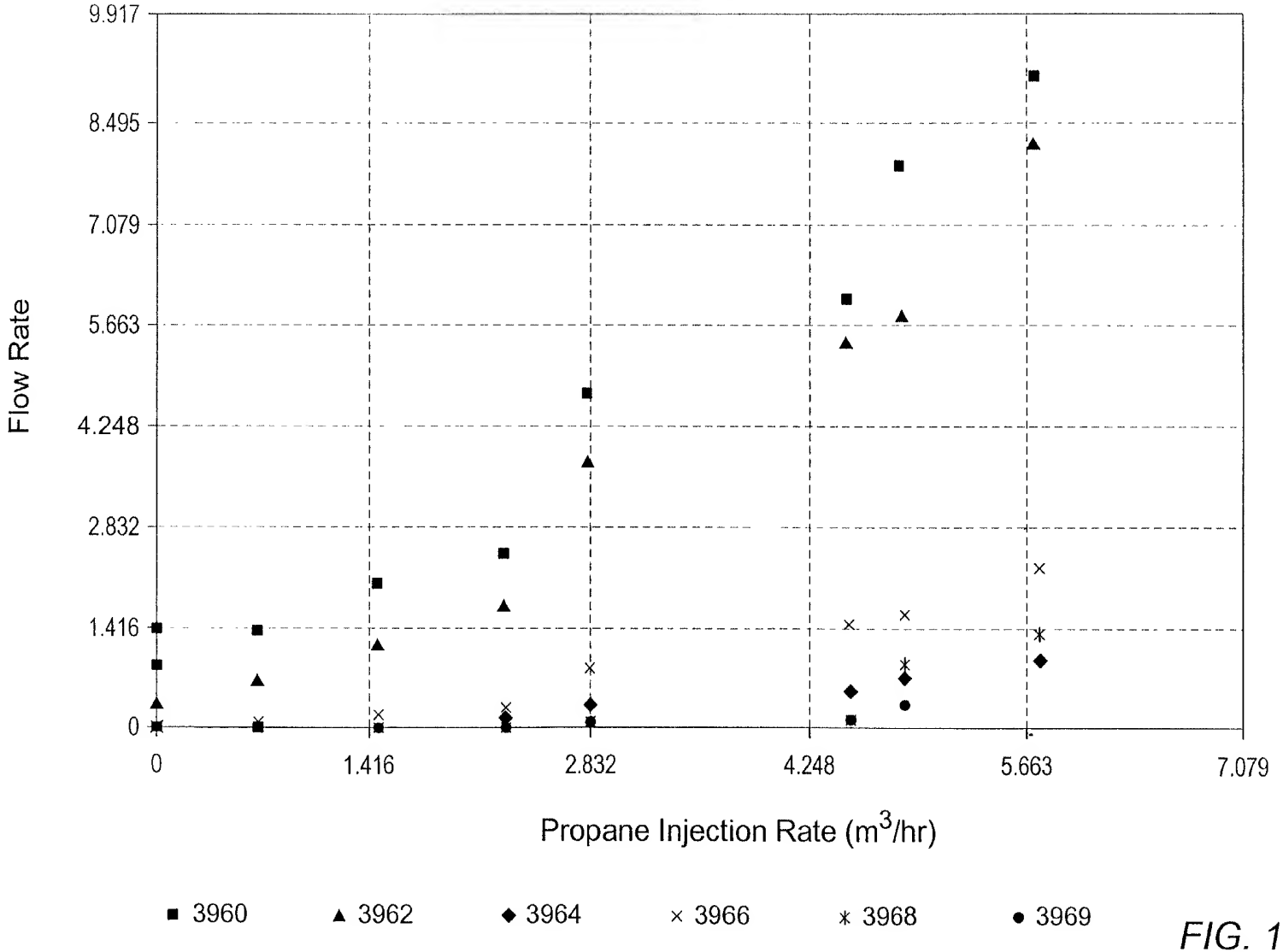
9.917
8.495
7.079
5.663
4.248
2.832
1.416
0
Flow Rate
0
1.416
2.832
4.248
5.663
7.079
Propane Injection Rate (m3/hr)
3960
3962
3964
3966
3968
3969

FIG. 117

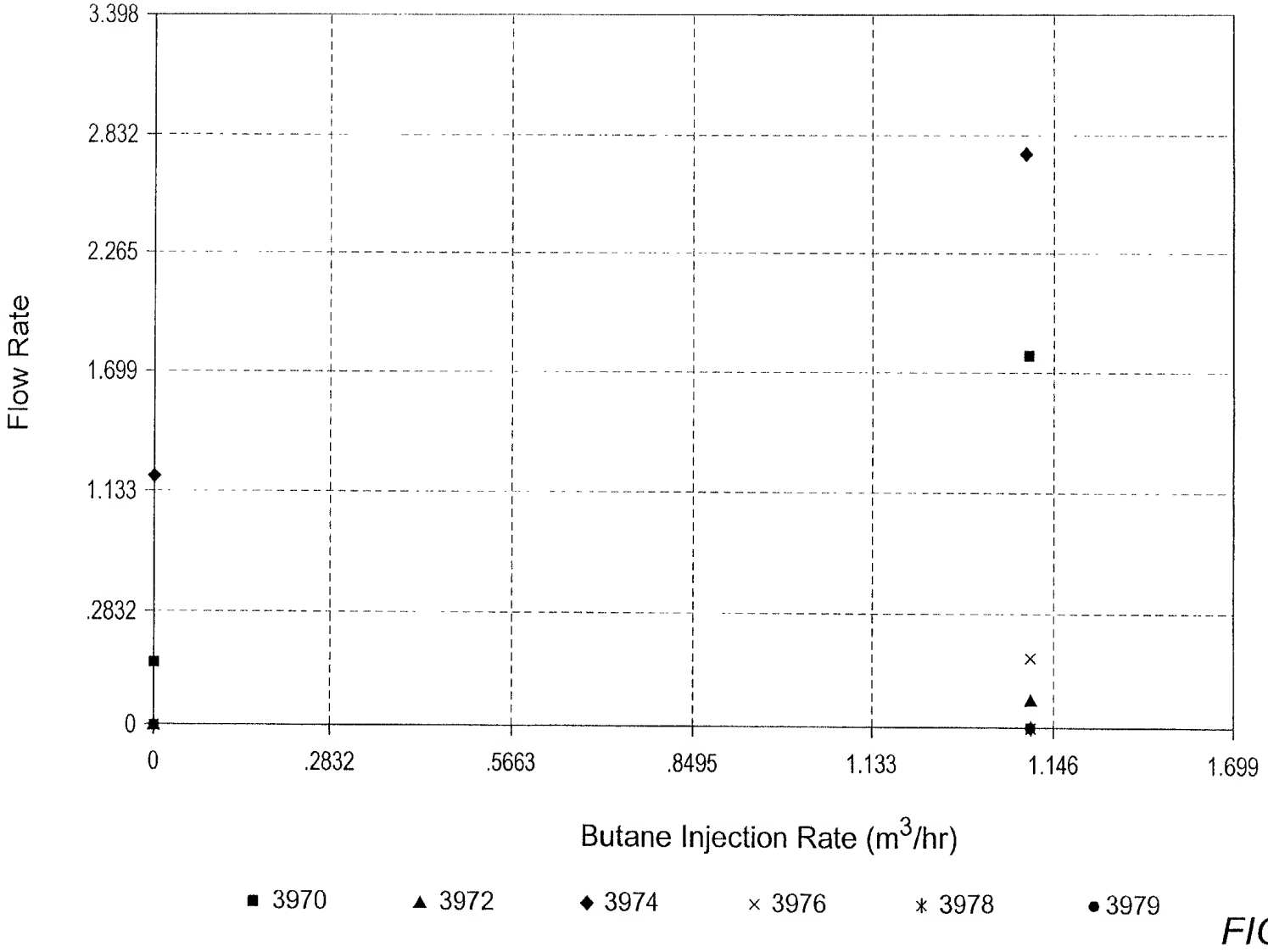
3.398
2.832
2.265
1.699
1.133
.2832
0
Flow Rate
0
.2832
.5663
.8495
1.133
1.146
1.699
Butane Injection Rate (m3/hr)
3970
3972
3974
3976
3978
3979

FIG. 118

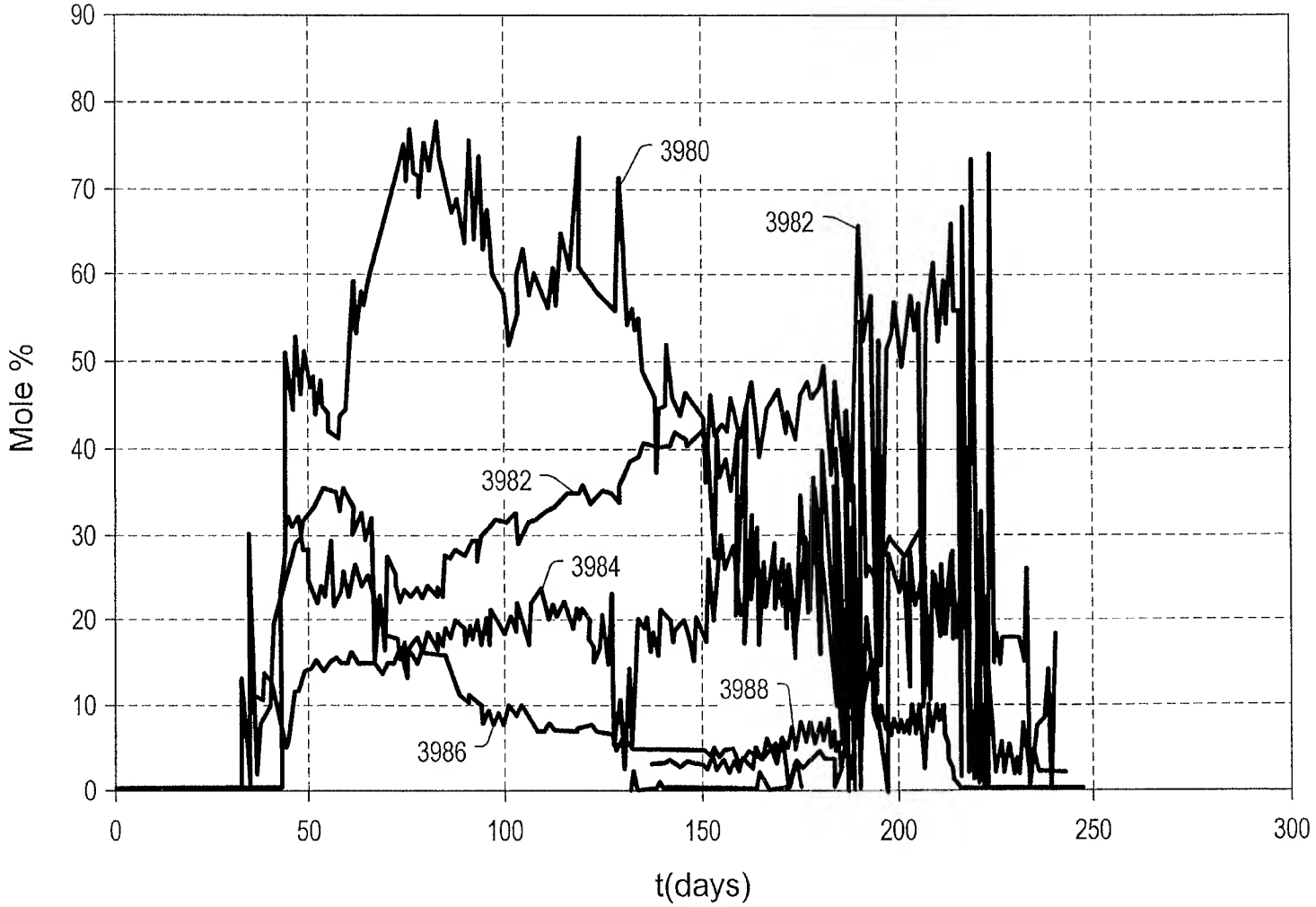
90
80
70
60
50
40
30
20
10
0
Mole %
0
50
100
150
200
250
300
t(days)
3980
3982
3982
3984
3988
3986

FIG. 119

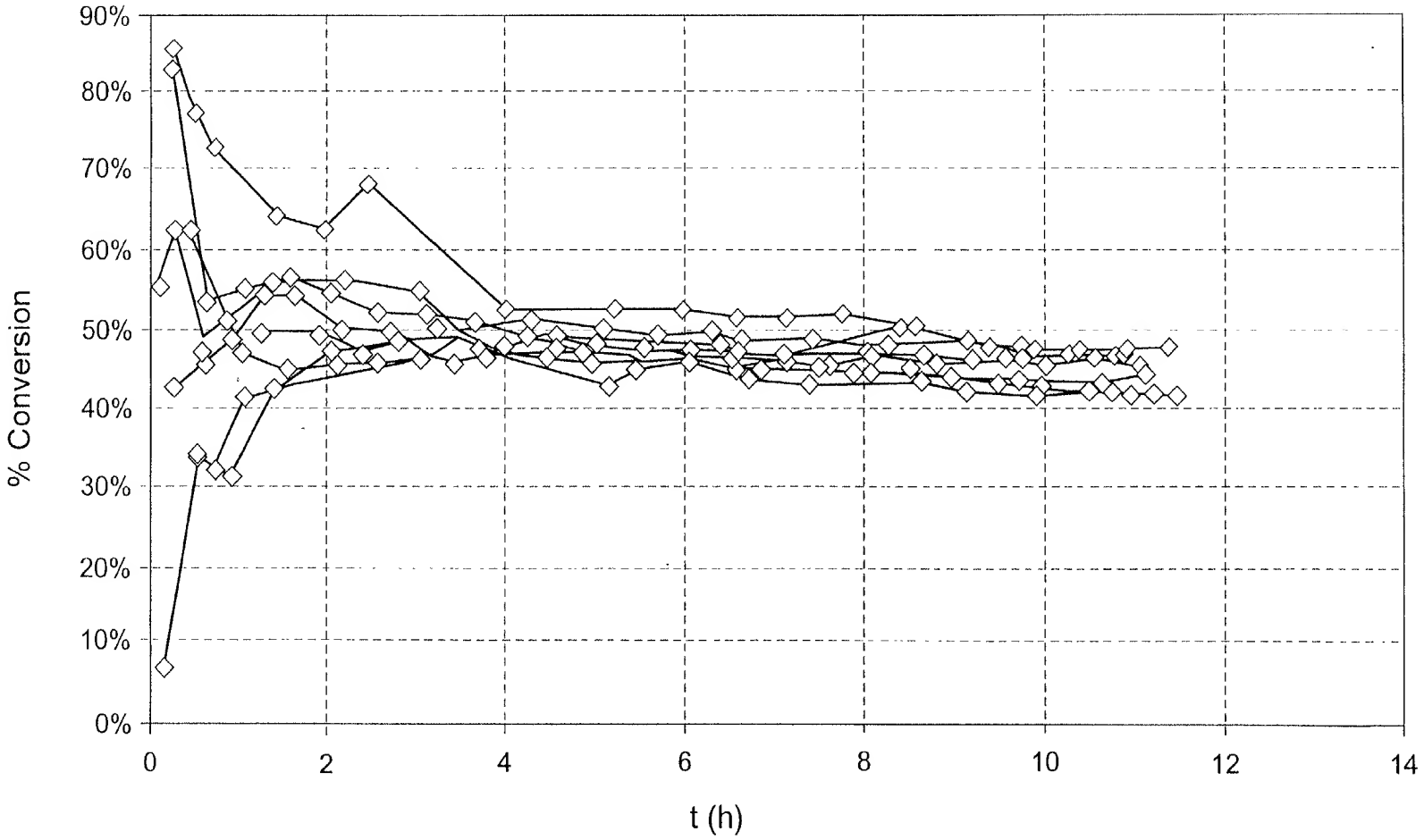

FIG. 120

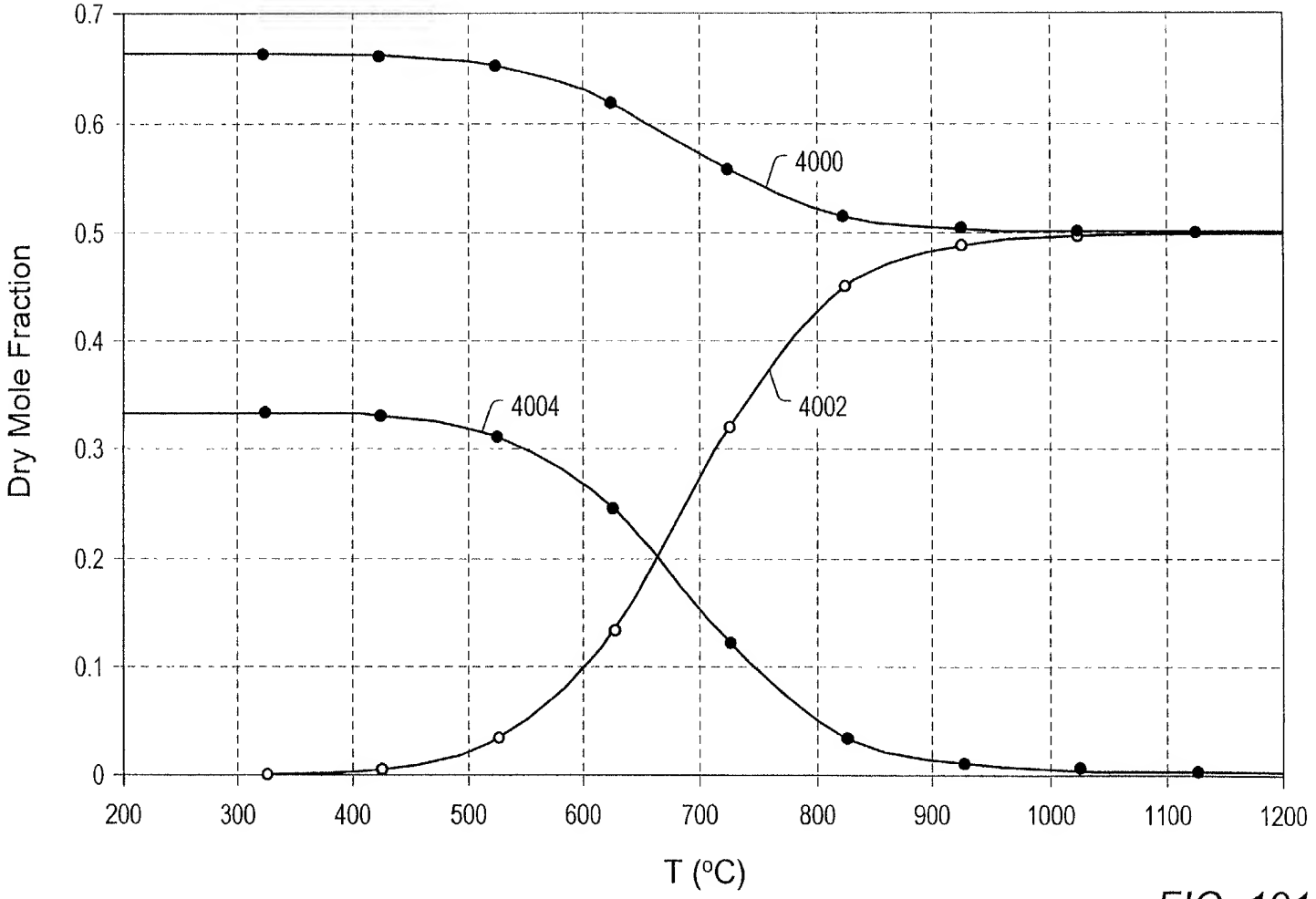
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Dry Mole Fraction
4000
4004
4002
200
300
400
500
600
700
800
900
1000
1100
1200
T (°C)

FIG. 121

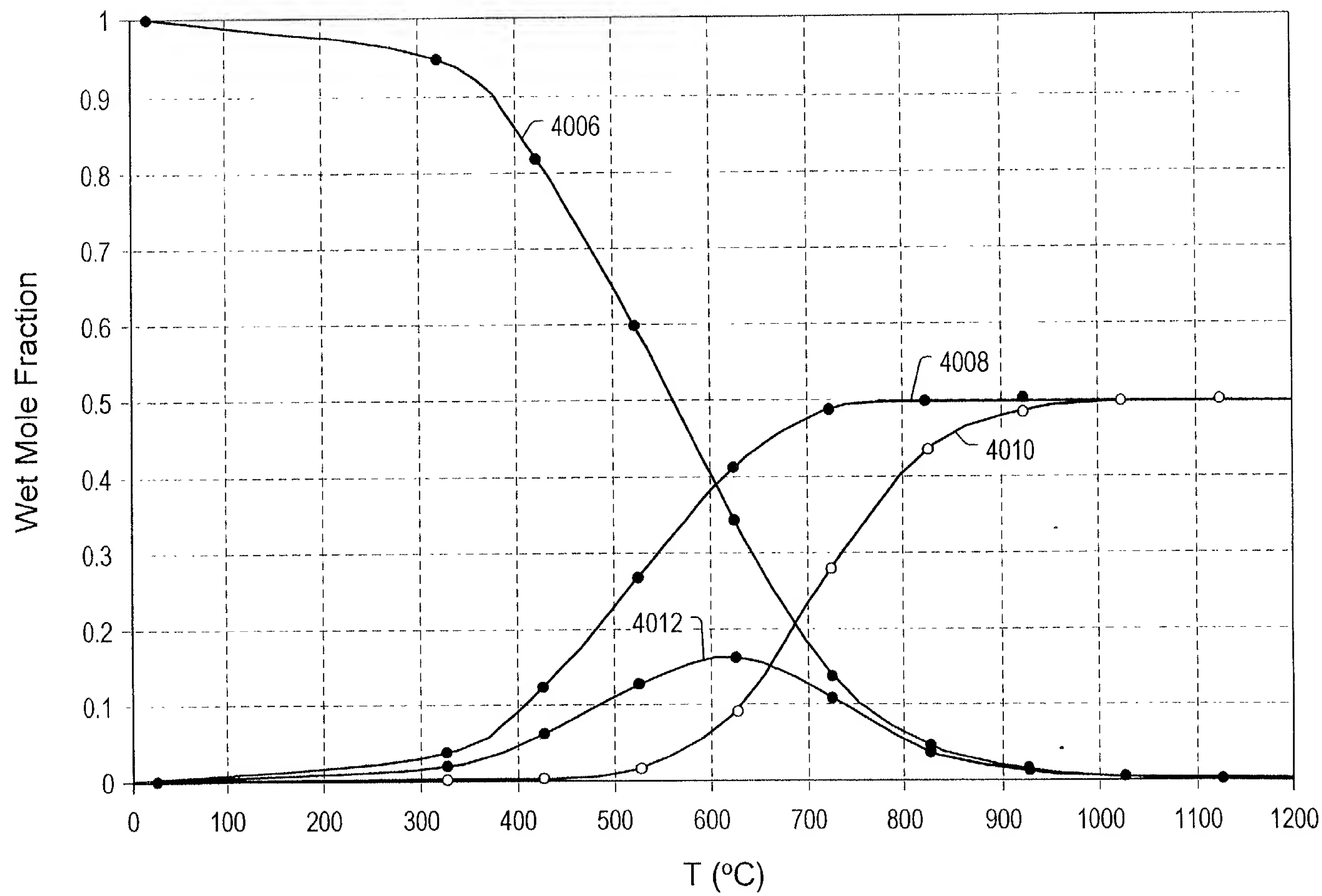
Wet Mole Fraction
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
T (°C)
4006
4008
4010
4012

FIG. 122

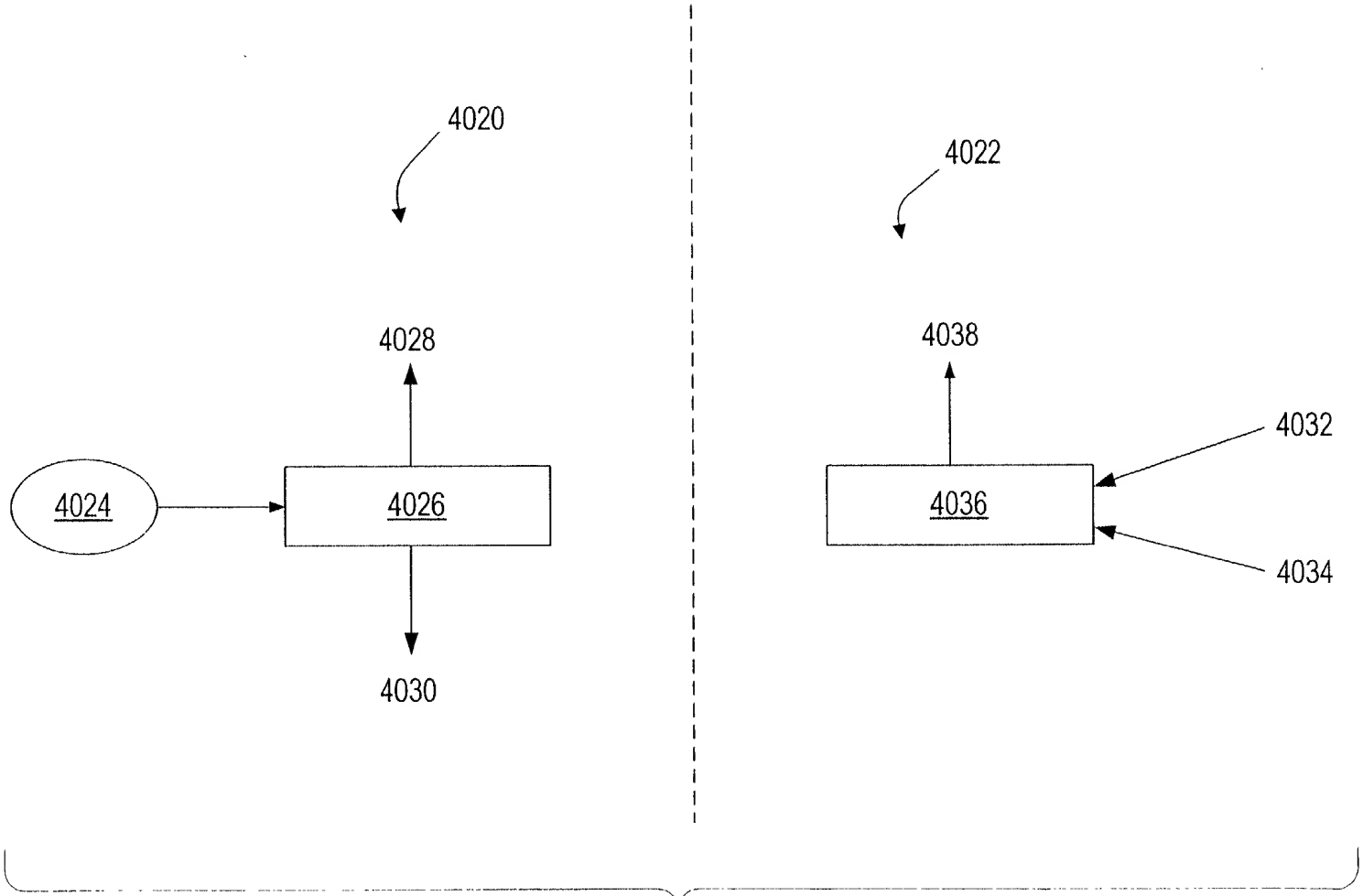

FIG. 123

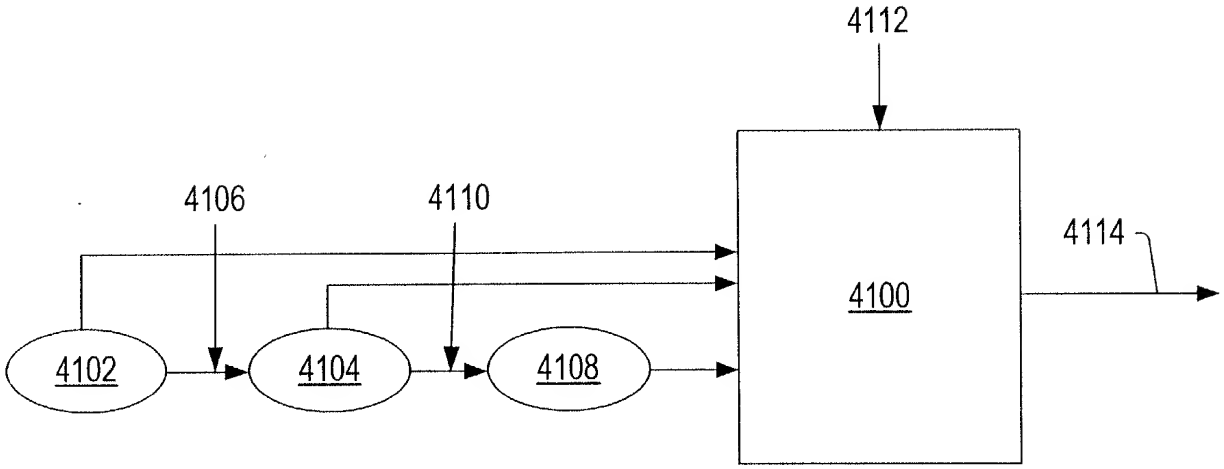

FIG. 124

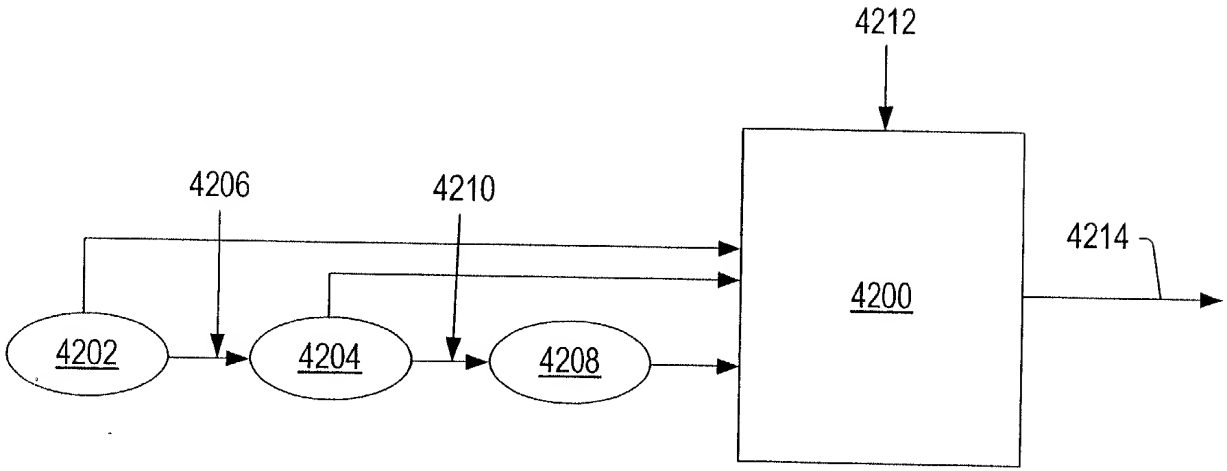

FIG. 125

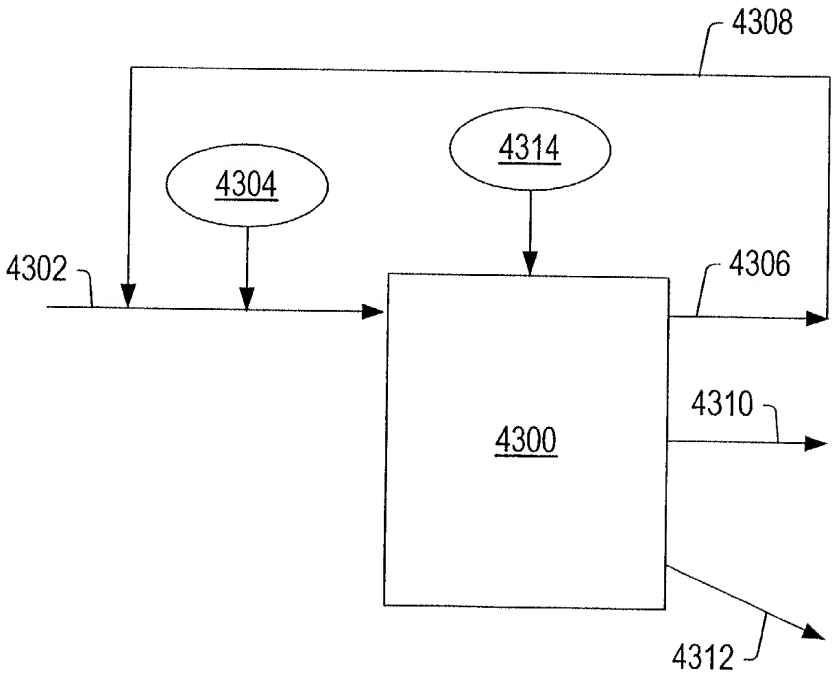

FIG. 126

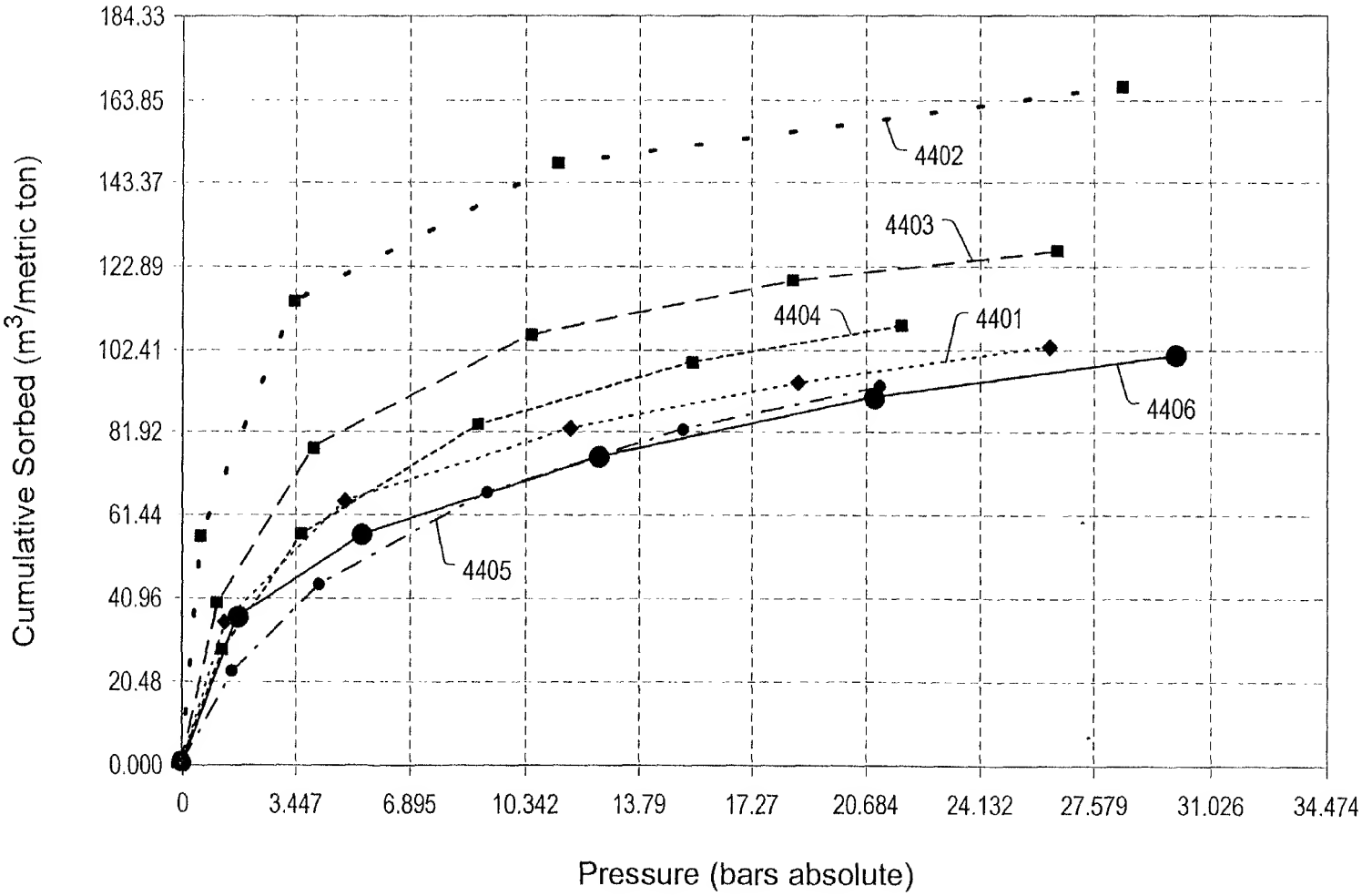
184.33
163.85
143.37
122.89
102.41
81.92
61.44
40.96
20.48
0.000
Cumulative Sorbed (m3/metric ton)
0
3.447
6.895
10.342
13.79
17.27
20.684
24.132
27.579
31.026
34.474
Pressure (bars absolute)
4402
4403
4404
4401
4406
4405

FIG. 127

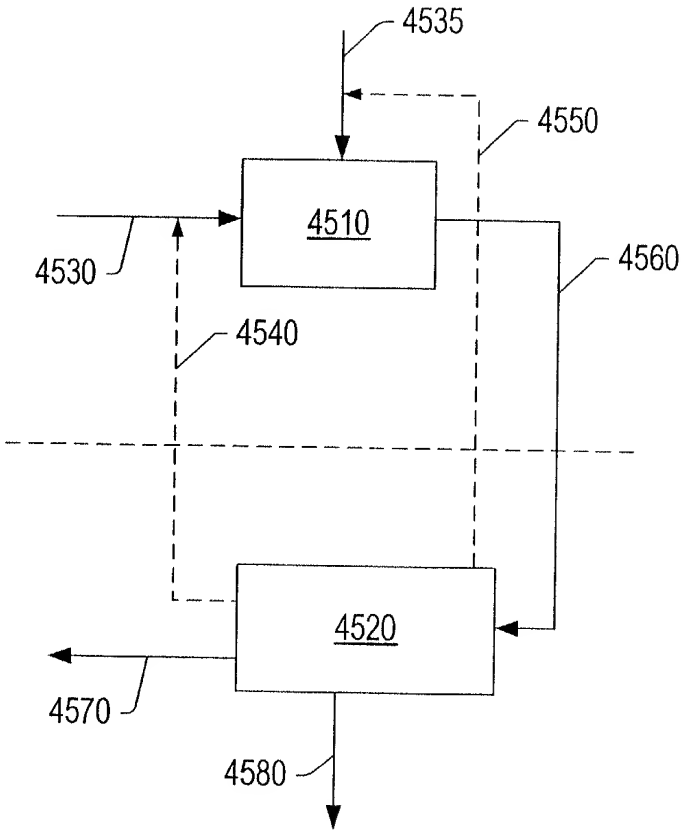

FIG. 128

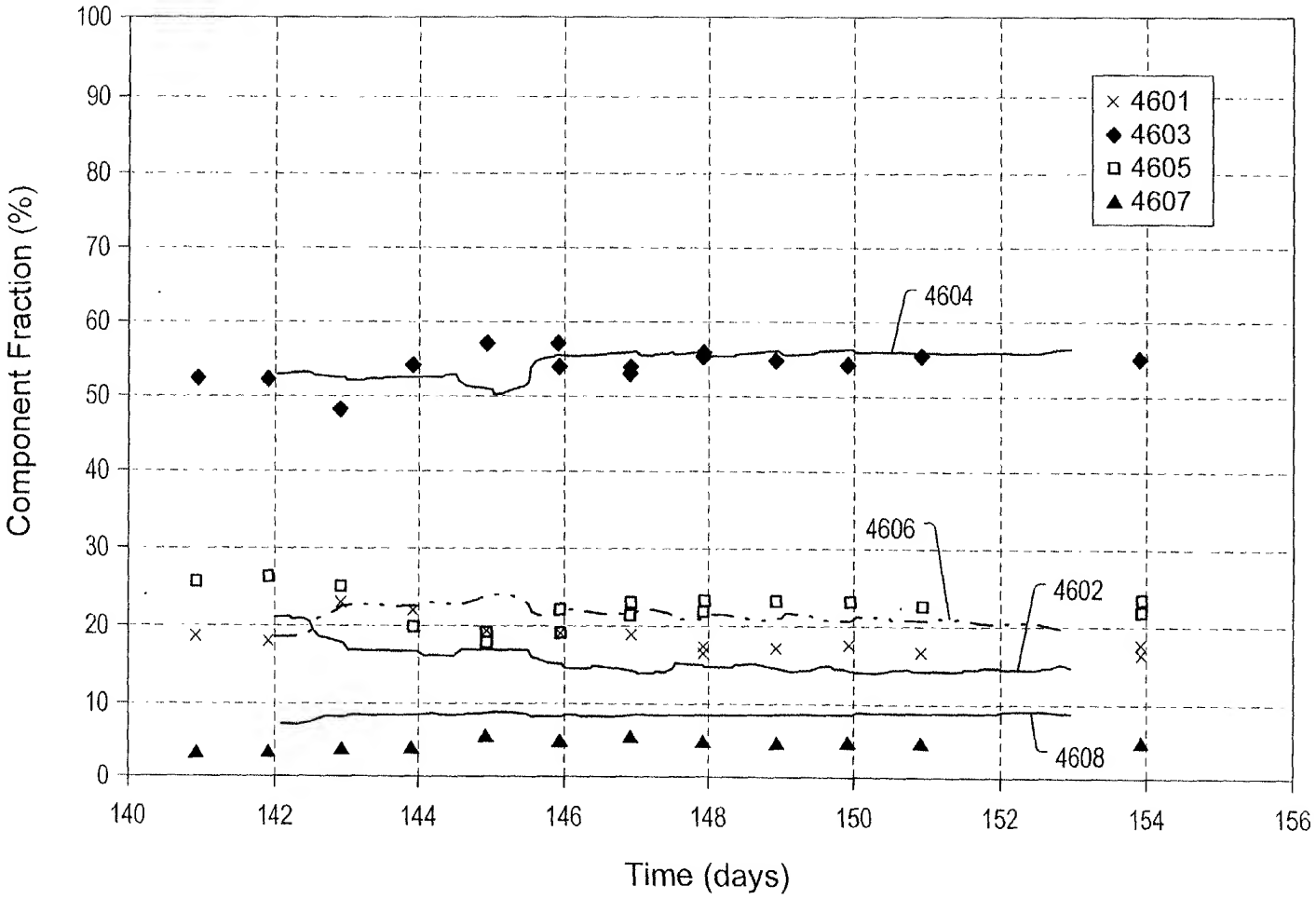
Component Fraction (%)
Time (days)
100
90
80
70
60
50
40
30
20
10
0
140
142
144
146
148
150
152
154
156
× 4601
◆ 4603
□ 4605
▲ 4607
4604
4606
4602
4608

FIG. 129

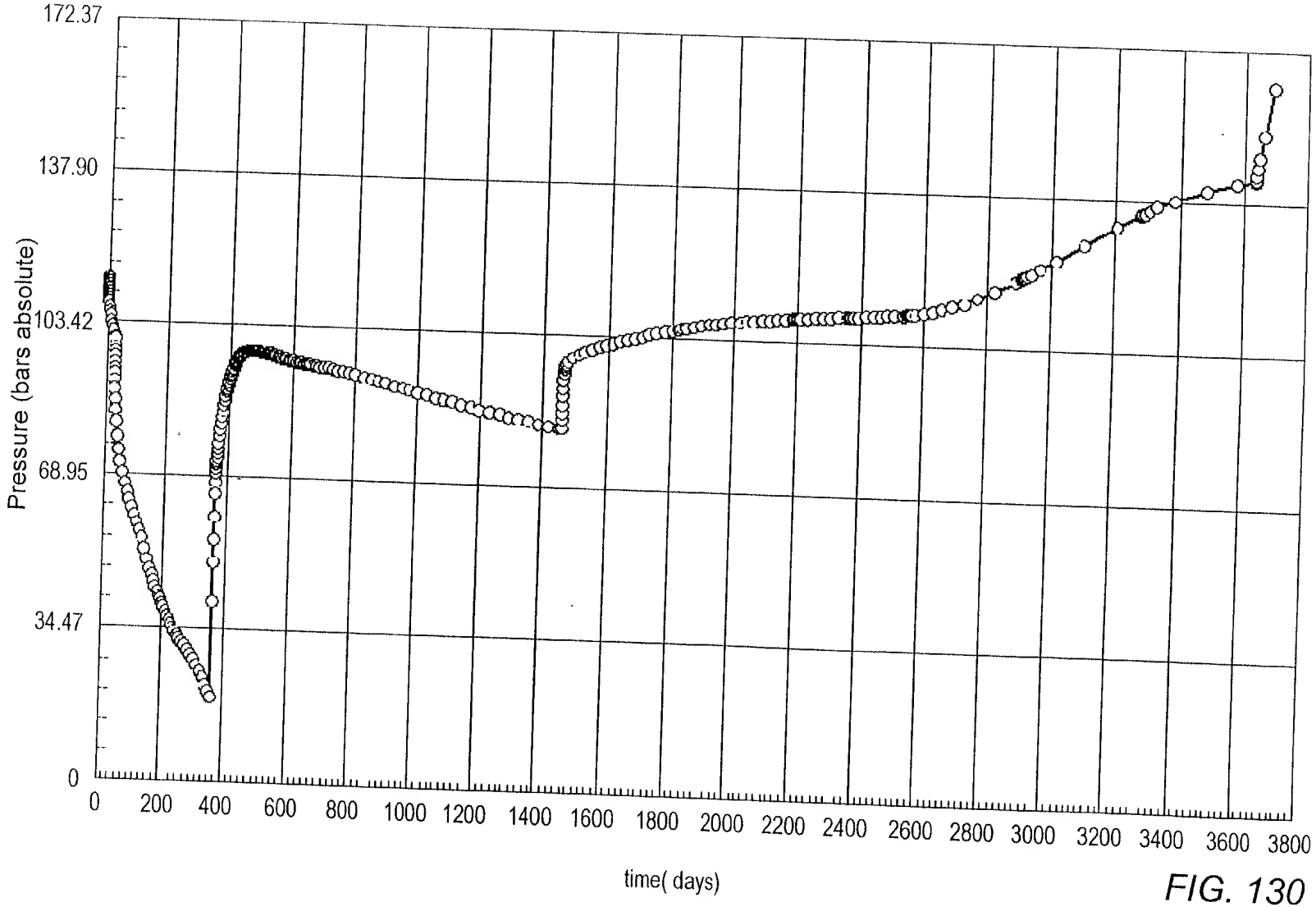
172.37
137.90
103.42
68.95
34.47
0
Pressure (bars absolute)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
time(days)

FIG. 130

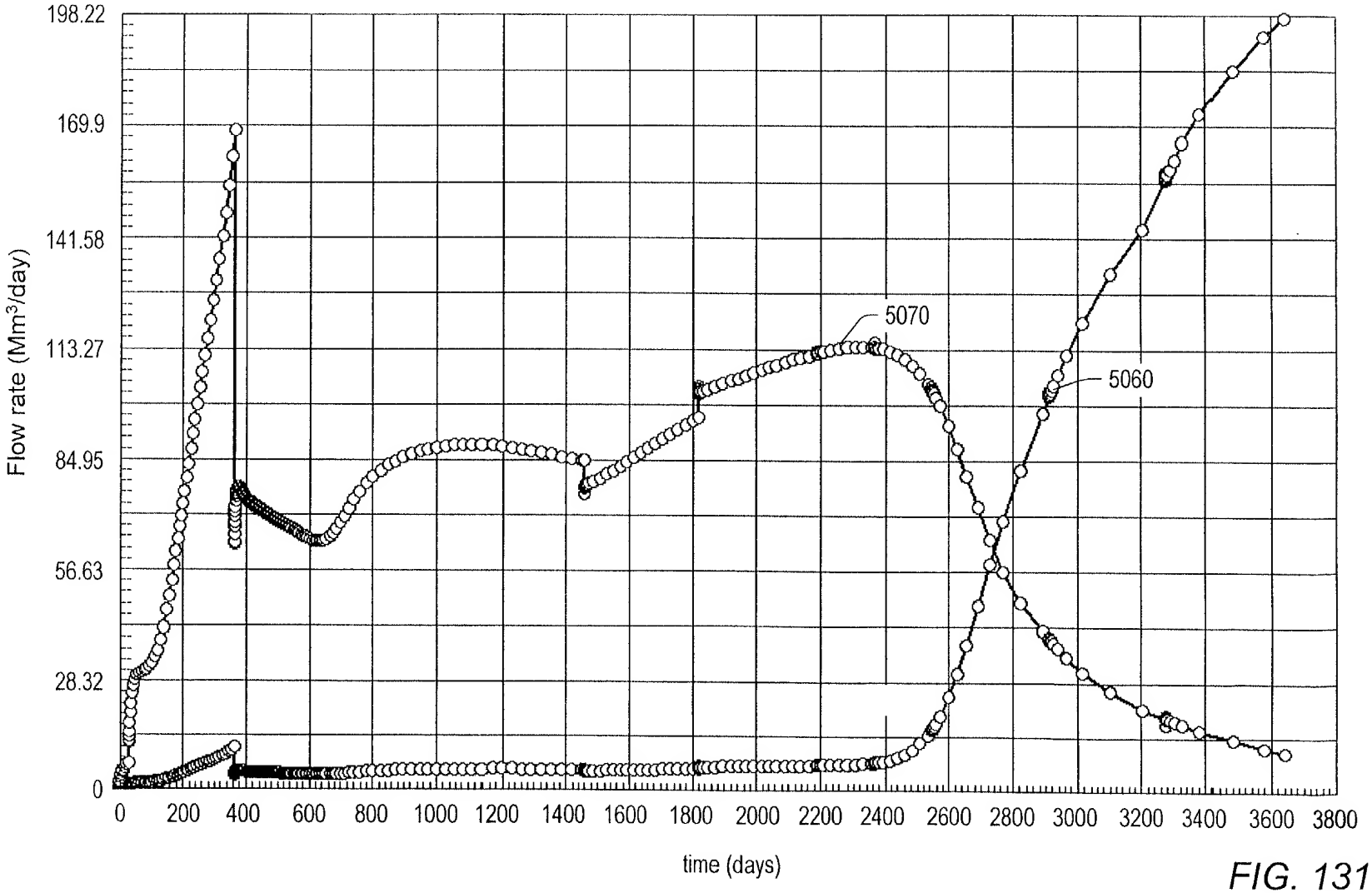
198.22
169.9
141.58
113.27
84.95
56.63
28.32
0
Flow rate (Mm³/day)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
time (days)
5070
5060

FIG. 131

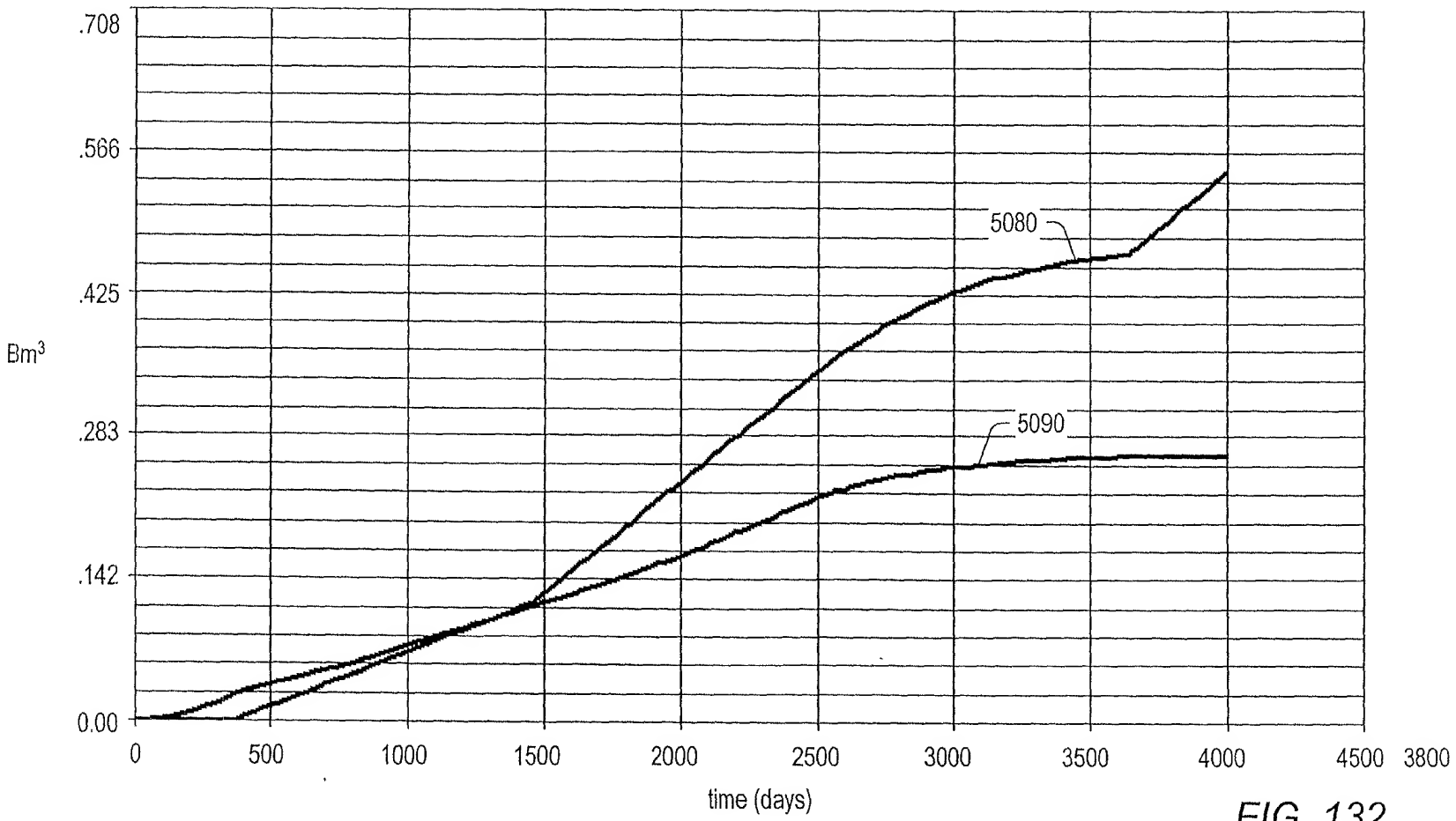
.708
.566
.425
.283
.142
0.00
Bm3
5080
5090
0
500
1000
1500
2000
2500
3000
3500
4000
4500
3800
time (days)

FIG. 132

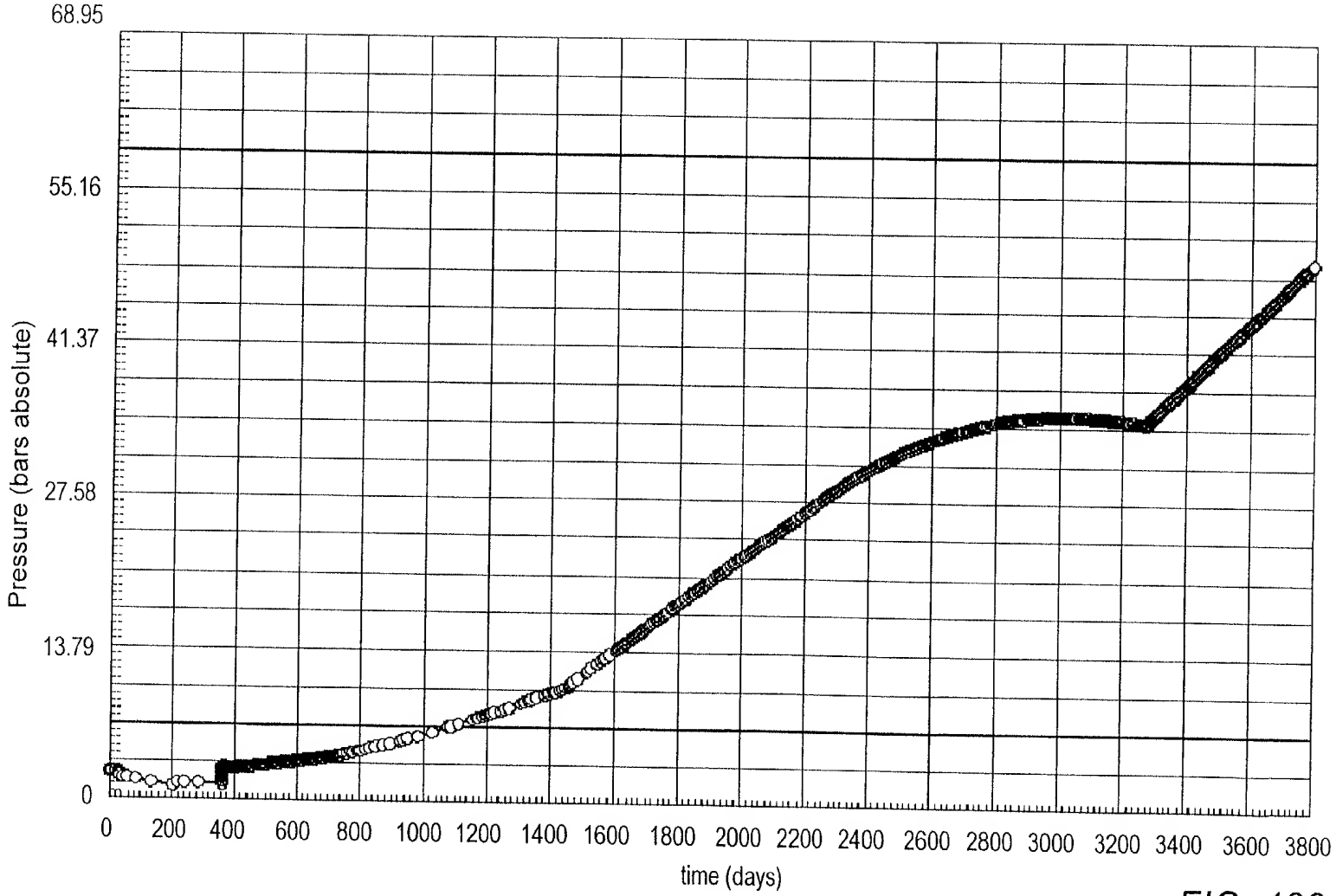
68.95
55.16
41.37
27.58
13.79
0
Pressure (bars absolute)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
time (days)

FIG. 133

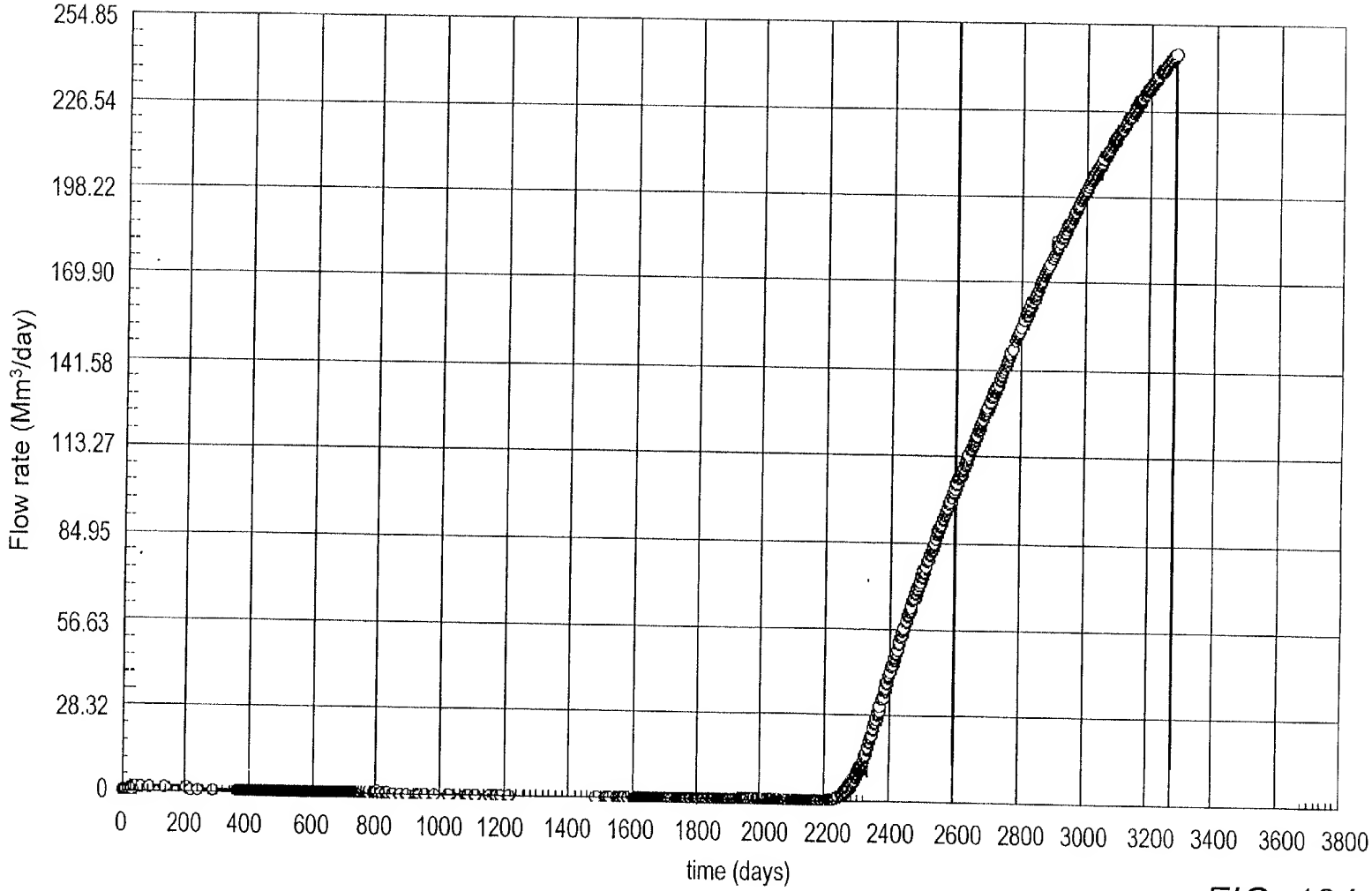
254.85
226.54
198.22
169.90
141.58
113.27
84.95
56.63
28.32
0
Flow rate (Mm³/day)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
time (days)

FIG. 134

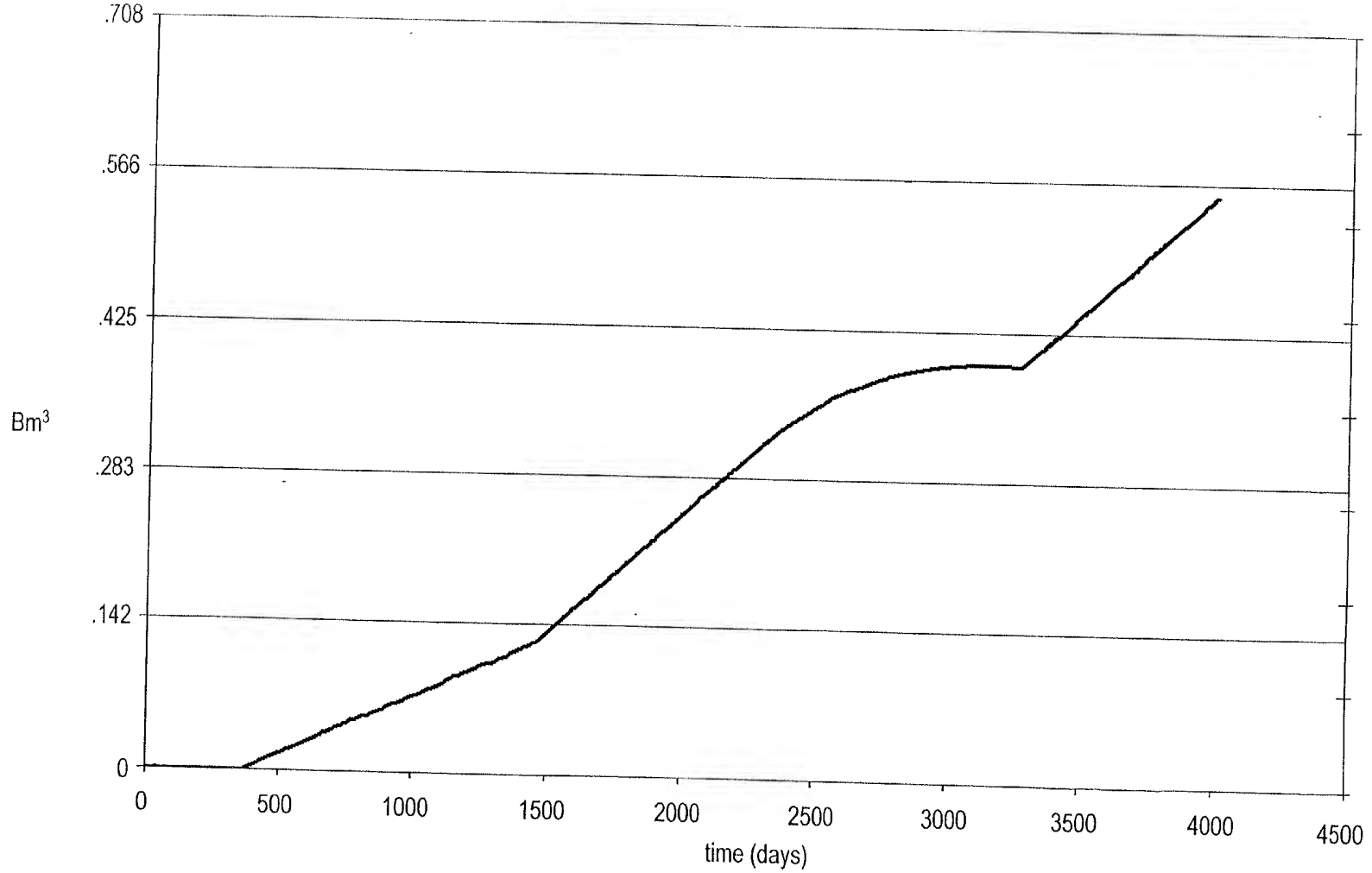
.708
.566
.425
.283
.142
0
Bm3
0
500
1000
1500
2000
2500
3000
3500
4000
4500
time (days)

FIG. 135